

ISLAMIAH COLLEGE

Accredited by NAAC with “A” Grade in 3rd Cycle

[Affiliated to Thiruvalluvar University, Vellore]

VANIYAMBADI – 635 752

(AIDED & SELF FINANCE)



SYLLABI BOOK XV

16TH ACADEMIC COUNCIL MEETING

(For the UG & PG Candidates Admitted from 2020-2021)

14Th JULY 2022

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFUR101	GE1	URDU I (PROSE, GRAMMAR & LETTER WRITING)	6	5

1. Sair Pehle Darwesh ki - Meer Amman Dehlavi
2. Ism aur Uski Qismein
3. Letter to the Principal Seeking leave

UNIT- II

1. Kaamyabi ka Qura'ni Raasta - Moulana Abul Kalam Azad
2. Fe'l aur Uski Qismein
3. Letter to the father/guardian asking money for payment of college fees

UNIT- III

1. Ummid ki Khushi - Sir Syed Ahmed Khan
2. Sifat aur Uski Qismein
3. Letter to a friend inviting him to your sister's marriage

UNIT- IV

1. Umar bin Abdul Aziz ki Kuch Khususiyat – Allama Shibli No'mani
2. Zameer aur Uski Qismein
3. Letter to the manager of a firm seeking employment

UNIT- V

1. Sawerey Jo Kal Aankh Meri Khuli – Putars Bukhari
2. Alamat-e-Faa'il "Ne" aur Alamat-e-Mafool "Ku" bananey ke Qaidey
3. Letter to a publisher of a book seller placing order for books.

Books for reference:

URDU NASAR edited by Dr M Sayeeduddeen , published by the Applied Books, New Delhi
 Mazhar-e-Adab Published by the Applied Books, New Delhi
 IntiKhaab –e- Nasr published by NCPUL, New Delhi

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFUR201	GE2	URDU II (GHAZALIAT, MANZOOMAT , RUBAIYAT & TRANSLATION)	6	5

UNIT - I

1. MEER TAQI MEER – Ulti hogayeen Sab tadbeerein kuch na dawa
Nay kam kiya
2. KHUSH AAMAD – NAZEER AKBAR ABADI
3. MEER ANEES – Gulshan me phirun k sair sehra dekhun

UNIT - II

1. GHALIB – Hazaron Khahishein aisi ke har khahish pe dum nikle
2. SHIKWA – ALLAMA IQBAL
3. AMJAD – Is naam ki zindagi me kuch jan to ho

UNIT- III

1. NIYAZ VANIYAMBADI – Hum O hain jo k waqt ki chalon me aagaye
2. JAWAB-E-SHIWA—ALLAMA IQBAL
3. AKBAR – Gaflat ki hansa se aah bharna achcha

UNIT - IV

1. SHAKIR Vaniyambadi – Jaan dena kya hai niyyat chahiye
2. TAJ MAHAL—SAHIR LUDHIANAWI
3. JOSH – Pa mal-e-Gham insane huwa jata hai

UNIT - V

1. JIGAR MURADABADI – Duniya ke sitam yaad na apni hi wafa yaad
2. SUBH-E-AZADI—FAIZ AHMED FAIZ
3. ASGAR VELLORI – Dhoondha to kitabon me sadaqat na mili
4. TRANSLATION from English to Urdu

Books for reference:

URDU SHAYERI Published by the Applied Books, New Delhi

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COURSE OUTCOMES
SEMESTER I (PROSE, GRAMMAR & LETTER WRITING)

1. Prose makes students understand National Integration and they inculcate moral and human values within themselves.
2. Develop their creative thinking and writing in prose.
3. Students will be able to write and use the language correctly and they develop the correct grammar sense.
4. Students to develop skill in writing and communicating to other personalities through letter.
5. They develop the correct grammar sense.
6. They will be able to communicate effectively.

COURSE OUTCOMES: URDU PAPER II

GHAZALIAT, MANZOOMAT , RUBAIYAT & TRANSLATION

1. Students will be able to learn and inculcate moral and ethical values through Ancient & Medieval poets like Mirza Ghalib & Allama Iqbal.
2. Students will be able to enjoy and appreciate modern poetry.
3. They will be able to understand Modern Period through poets and authors prescribed.
4. Students develop skill to translate from one language to another through translation practice.
5. Students will face for the post of Translator in the office of Leading Urdu National Newspapers.

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SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFAR101	GE1	ARABIC I (PROSE & GRAMMAR, TRANSLATION)	6	5

Course Objectives:

Students are aimed to develop the correct pronunciation of the Arabic Alphabet and write them joint to gather as per the given rules and to acquire adequate ability to form meaningful words and small sentences in Arabic.

Unit - I	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 1, 2 & 3
Unit - 2	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 4, 5 & 6
Unit - 3	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 7, 8, 9 & 10
Unit - 4	Basic Arabic Grammar	Lesson 1 to 15
Unit - 5	Arabic for Beginners	Lesson 6 to 10

Prescribed Text Book:

Title of the Book	Author Name	Publishing House
Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Dr. V. Abdur Raheem	I. F. T. Chennai
Basic Arabic Grammar	Dr. Syed Rahmatullah	Deen Store, Chennai
Arabic for Beginners	Dr. Syed Ali	Chennai

Reference / Recommended Book for Study:

Title of the Book	Author Name	Publishing House
Al Arabiyyah lil Hayat	Nasif Musthafa,	King Saud University Riyadh.

Course Outcomes:

Students will be able to

CO1: To get to know the ability to distinguish different alphabets.

CO2: To develop the skill of reading

CO3: To enhance the skill of writing

CO4: To clearly understand the basic grammar

CO5: To gain the skill of translation

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFAR201	GE2	ARABIC II (PROSE & POETRY)	6	5

Course Objectives:

Students are expected to develop the construction of the sentence based on the lessons taught and to gain translation skills.

Unit - I	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 11, 12, 13 & 14
Unit - 2	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 15, 16, 17 & 18
Unit - 3	Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Lesson 19, 20, 21, 22 & 23

Unit - 4	Poetry - Qasaa'id-us-Sahala	Selected Poems
Unit - 5	Poetry - Qasaa'id-us-Sahala	Selected Poems

Prescribed Text Book:

Title of the Book	Author Name	Publishing House
Durus-al-Lughat-al-arabiyyah li ghair al natiqina biha Vol-1.	Dr. V. Abdur Raheem	I. F. T. Chennai
Qasaa'id-us-Sahala	Dr. Md. Sulaiman Umari	Chennai

Reference / Recommended Book for Study:

Title of the Book	Author Name	Publishing House
Al Arabiyyah lil Hayat	Nasif Musthafa,	King Saud University Riyadh.

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFHD101	GE1	HINDI I	6	5

Course Objectives:

1. To acquaint the students with different forms of thoughts and styles used in Hindi Prose writing.
2. To develop a correct grammar sense for written communication.
3. To help the students to improve their writing and understanding skills.
4. To identify the values reflected in the content of Prose writings.

SYLLABUS :

I. PROSE: Text Book -‘GADYA NIKASH’

LESSONS PRESCRIBED:

1. MAHAVEER PRASAD DWIVEDI - LOBH
2. PREMCHAND - SABHYATA KA RAHASYA
3. DINAKAR - BHARAT EK HAI
4. HARISHANKAR PARSAYEE -KRANTIKARI KI KATHA
5. SUBHADRAKUMARI CHOUHAN – RAAHI

II. APPLIED GRAMMAR-

PRESCRIBED POINTS:

- a) LING
- b) VACHAN
- c) PRERANARTHAKRIYA
- d) VISHESHAN (Noun to Adjective)
- e) SHUDDH ROOP (Spell Check)

III. LETTERWRITING:

PRESCRIBED LETTERS: (PERSONAL & COMMERCIAL):

1. ORDERING FOR BOOKS
2. EMPLOYMENT LETTER
3. LETTER OF COMPLAINT
4. LETTER TO BANK
5. LEAVE LETTER. & 6. LETTER TO FRIEND.

IV. OFFICIAL CORRESPONDENCE:

- (i) ADMINISTRATIVE & BUSINESS TERMINOLOGY:
English To Hindi & Vice Versa
- (ii) PHRASES FROM HINDI TO ENGLISH only

[Prescribed terminology Enclosed]

V. FUNCTIONAL HINDI – COMPREHENSION

(Anuvad -Abhyas – 3 : 1-10 Hindi Passages)

BOOK FOR STUDY: 1. GADYA NIKASH, Ed. SHAIK ABDUL WAHAB, SANRACHNA PRAKASHAN, ALLAHABAD.

1. ANUVAD – ABHYAS – 3, D.B.HINDI PRACHAR SABHA, CHENNAI

BOOKS FOR REFERENCE:

1. SHAIKSHIK VYAKARAN AUR VYAVAHARIK HINDI, Dr.KRISHNA KUMAR GOSWAMI, AALEKH PRAKASHAN, DELHI – 32. VYAVASAYIK HINDI, Prof. RAHAMATHULLAH, VANI PRAKASHAN, NEW DELHI.
2. SAMPOORNA HINDI VYAKARAN, SREESHARAN & SRI ALOK KUMAR RASTOGI, MADHUR BOOKS, NEW DELHI - 51.
3. GLOSSARY OF ADMINISTRATIVE TERMINOLOGY, MINISTRY OF HRD, NEW DELHI, 2004.

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PREScribed TERMINOLOGY: IV

ADMINISTRATIVE AND BUSINESS TERMINOLOGY

i) ENGLISH TO HINDI and VICE VERSA:-

ACCOUNTANT = लेखपाल; ACTING = कार्यकारी; ADMINISTRATOR = प्रशासक; ALLOTMENT = आबंटन; AUCTION = नीलाम; AUDITOR = लेखा परीक्षक; ALLOWANCE = भत्ता; BALANCE SHEET = तुलन पत्र; BROKER = दलाल; MANAGER = प्रबंधक; BEARER = धारक; CABINET = मंत्रिमंडल; CIRCULAR = परिपत्र; CLERK = लिपिक; CONTROLLER = नियंत्रक; CONSUMER = उपभोक्ता; COMMISSIONER = आयुक्त; CASHIER = रोकडिया; COMPUTERIZATION = संगणीकरण; CUSTOMER = ग्राहक; DEBENTURE = ऋणपत्र; DIRECTOR = निदेशक; DOCUMENT = प्रलेख / दस्तावेज; EDITOR = संपादक; ELECTION = चुनाव; EMPLOYMENT = रोजगार; EXCHANGE = विनिमय; FUND = निधि; GOVERNOR = राज्यपाल; GRANT = अनुदान; GAZETTE = राजपत्र; INCOME TAX = आयकर; INSPECTOR = निरीक्षक; INSURANCE = बीमा; INVOICE = बीजक; MAYOR = महापौर; MINISTRY = मंत्रालय; PRIME MINISTER = प्रधान मंत्री; MINISTRY OF DEFENCE = रक्षा मंत्रालय; MINISTRY OF FINANCE = वित्त मंत्रालय; MINISTRY OF HOME = गृह मंत्रालय; MINISTRY OF HEALTH = स्वास्थ्य मंत्रालय; MINISTRY OF RAILWAYS = रेल मंत्रालय; MINISTRY OF EXTERNAL AFFAIRS = विदेश मंत्रालय; MINISTRY OF COMMERCE = वाणिज्य मंत्रालय; OPERATOR = प्रचालक; PARLIAMENT = संसद; PASSPORT = पारपत्र; QUALIFICATION = अर्हता / योग्यता; SECRETARY = सचिव; DEPUTY SECRETARY = उप सचिव; JOINT SECRETARY = संयुक्त सचिव; GENERAL SECRETARY = महा सचिव; SUPER TAX = अधिकर; TENDER = निविदा; TYPIST = टंकक; UNDERTAKING = उपक्रम; VICE CHANCELLOR = कुलपति; WHIP = सचेतक.

ii) HINDI TO ENGLISH PHRASES:

तदनुसार = ACCORDINGLY; यथा प्रस्ताव अनुमोदित = APPROVED AS PROPOSED; यथा संभव = AS FAR AS POSSIBLE; के प्राधिकार से = BY AUTHORITY OF; पद के नाते = by VIRTUE OF OFFICE; अनुमोदनार्थ प्रारूप = DRAFT FOR APPROVAL; कार्रवाई शीघ्र करें = EXPEDITE ACTION; मुझे निदेश हुआ है = I AM DIRECTED TO; से परामर्श करके = IN CONSULTATION OF; अमुमति दी जाये = MAY BE PERMITTED; पक्ष-विपक्ष = PROS AND CONS; देख लिया, धन्यवाद = SEEN, THANKS; प्रमाणित किया जाता है = THIS IS TO CERTIFY; की सीमा तक = TO THE EXTENT OF; के बारे में = with REGARD TO; अवलोकनार्थ = FOR PERUSAL; सूचनार्थ = FOR INFORMATION; मार्गदर्शन के लिए = FOR GUIDANCE; हस्ताक्षर के लिए = FOR SIGNATURE; के आदेश से = BY ORDER; लागु होना = COME INTO FORCE; टिप्पणी के लिए = FOR COMMENTS; आज ही जारी करें = ISSUE TODAY; पालन करना = ABIDE BY; इस मामले/ विषय में = IN THIS CASE / IN THIS INSTANCE.

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBFHD201	GE3	HINDI II	6	5

Course Objectives:

1. Fiction and One – Act plays to the students for appreciation and critical analysis.
2. To help students develop their creative thinking and writing.
3. Dialogue Writing enables students to develop the effective communicative skills
4. To help students develop Practical translation skills.

SYLLABUS AND BOOKS PRESCRIBED:

I. ONE ACT PLAY: GADYA MUKUR

LESSONS PRESCRIBED :

1. RAMKUMAR VARMA -CHARUMITRA
2. HARIKRISHNA PREMI - RAKSHA BANDHAN
3. UDAYSHANKAR BHATT - DAS HAZAR.

II. SHORT - STORY: TEXT –GADYA MUKUR

(Non Detailed Study)

LESSONS PRESCRIBED:

1. PREMCHAND - NAMAK KA DAROGA
2. CHANDRADHAR SHARMA GULERI - USNE KAHA THA
3. MARKANDEY – MAHUYE KA PED

III. APPLIED GRAMMAR:

1. SAMANARTHI SHABD 2. VILOM SHABD 3. ANEKARTHAK SHABD 4. YUGM SHABD 5. ABSTRACT NOUN.

IV. DIALOGUE WRITING:

PRESCRIBED POINTS:

1. ADHYAPAK AUR VIDYARTHI 2. DUKANDAR AUR GRAHAK 3. DUKANDAR AUR VIDYARTHI 4. DOCTOR AUR ROGI
5. DO YAATRI 6. DO MITRA.

V. TRANSLATION PRACTICE:

ENGLISH TO HINDI only

LESSONS PRESCRIBED: ENGLISH TO HINDI - 16, 17, 18, 19 & 20.

BOOKS FOR STUDY : 1.GADYA NIKASH, Ed. Shaik Abdul Wahab, SANRACHNA PRAKASHAN,

PRAYAGRAJ.

2. GADYA MUKUR, RAKA PRAKASHAN, PRAYAGRAJ.

3. ANUVAD ABHYAS – I, D.B.HINDI PRACHAR SABHA, CHENNAI.

BOOKS FOR REFERENCE :

1. HINDI: SHABD – ARTH – PRAYOG BY DR.HARDEV BAHRI, ABHIVYAKTI PRAKASHAN, ALLAHABAD.
2. SHAIKSHIK VYAKARAN AUR VYAVAHARIK HINDI, Dr. KRISHNA KUMAR GOSWAMI, AALEKH PRAKASHAN, DELHI – 32.
3. BOLCHAL KI HINDI, Dr. SUSHEELA GUPTA, LOKBHARATI PRAKASHAN, ALLAHABAD, 2006

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COURSE LEARNING OUTCOME	CODE : UBFHD101	HINDI - I	CREDITS - 5
CL01	Understand National Integration (Dinakar) and inculcate moral and human values within themselves through prose.		
CL02	Develop their creative thinking and writing in prose.		
CL03	Identify, write and use the language correctly and develop the correct Grammar sense.		
CL04	Improve letter writing skills.		
CL05	Develop the ability to fully understand what is being read with Comprehension.		

COURSE LEARNING OUTCOME	CODE : UBFHD201	HINDI - II	CREDITS - 5
CL01	Understand and promote communal harmony, humanity and patriotism through One Act Plays.		
CL02	Understand and inculcate loyalty, human values through short stories.		
CL03	Develop skill to translate from one language to another through translation practice		
CL04	Improve effective Communication skill through Dialogue Writing		
CL05	Develop the correct grammar sense		

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SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBFTA101	GE1	TAMIL I	6	5

Course Objectives

1. சங்க இலக்கியச் சிறப்புகளை மாணவர்களுக்கு எடுத்துரைத்தல்
2. நீதி இலக்கியங்களின் இன்றியமையாமையை அறிவுறுத்தல்
3. உரைநடை இலக்கியத்தின் தனித்தன்மைகளை விளக்குதல்
4. மொழித்திறன்களை மாணவர்களுக்குப் பயிற்சியுடன் பயிற்றுவதில்
5. நாட்டார் வழக்காற்றியலில் வேளாண் சார்ந்த பாடல்களை மாணவர்களுக்கு அறிமுகம் செய்தல்

Course Outcomes

1. சங்க இலக்கியத்தின் தனிச்சிறப்புகளை அறிந்திருப்பர்
2. நீதி இலக்கியங்களின் இன்றைய தேவையினைத் தெளிவாகப் புரிந்திருப்பர்
3. உரைநடை இலக்கியத்தின் அமைப்பினைத் தெரிந்திருப்பர்
4. மொழித்திறன் தொடர்பான அடிப்படை அறிவினை வளர்த்திருப்பர்
5. வேளாண் பாடல்களின் அமைப்பினையும் சிறப்பினையும் நன்கு அறிந்திருப்பர்

Unit-I	UNIT TITLE	4-- Hours
	அலகு 1 - சங்க இலக்கியம் ஐங்குறுநூறு 5 பாடல்கள் (பாடல் எண்கள் 41, 101, 271, 341, 442) புறநானூறு 5 பாடல்கள் (பாடல் எண்கள் 74, 86, 191, 192, 312) பரிபாடல் 2 பாடல்கள் (பாடல் எண் 9 (11 முதல் 25 அடிகள் வரை, பாடல் எண் 2 (36 முதல் 51 அடிகள் வரை)	

Unit-II	UNIT TITLE	4-- Hours
	அலகு 2 - நீதி இலக்கியம் திருக்குறள் - ஒழுக்கம் உடைமை அதிகாரம் நாலடியார் - கல்வி (பாடல் எண்கள் 131 - 135) மூதுரை 5 பாடல்கள் (பாடல் எண்கள் 4, 7, 10, 16, 19)	

Unit-III	UNIT TITLE அலகு 3 - உரைநடை 1. மு.வரதராசனார் – இலக்கிய ஆராய்ச்சி (நல்ல நூல்) 2. தி. செளரிப் பெருமாள் அரங்கனார் – முனைவர் ப.சிவராஜி 3. கல்விக்காவலர் கா.கா. முகமது சுபைர் – முனைவர் ப.சிவராஜி	4-- Hours
Unit-IV	UNIT TITLE அலகு 4 - மொழித்திறன் அகர வரிசைப்படுத்தல், எழுத்துப்பிழை நீக்கம், வல்லினம் மிகுமிடம், கலைச்சொல்லாக்கம், நிறுத்தற் குறியீடுகள்	4-- Hours
Unit-V	UNIT TITLE அலகு 5 - நாட்டுப்புறவியல் வேளாண் பாடல்கள் (ஏற்றப்பாட்டு, வண்டிக்காரன் பாட்டு, நடவுப் பாடல், தெம்மாங்குப்பாட்டு, தொழில்பாட்டு)	4- Hours
Books for Study: அடித்தளப்படிப்பு – தமிழ் – முதலாமாண்டு - முதற்பருவம்		
Books for Reference: 1. சங்க இலக்கியம் – பத்துப்பாட்டு 2. நீதி இலக்கியங்கள் 3. இலக்கிய ஆராய்ச்சி – மு.வரதராசனார் 4. மொழித்திறன் – ஸ்ரீசந்திரன் 5. நாட்டுப்புறவியல் ஆய்வு – சு.சக்திவேல் 6. தமிழ் இலக்கிய வரலாறு – மு.வரதராசனார் 7. தமிழ் இலக்கிய வரலாறு – ச.வே.சுப்ரமணியன்		

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBFTA201	GE3	TAMIL II	6	5

Course Objectives

1. பக்தி இலக்கியத்தின் இறைதத்துவத்தை விளக்குதல்
2. காப்பிய இலக்கியத்தின் கட்டமைப்பினை எடுத்துரைத்தல்
3. உரைநடை இலக்கியத்தின் சிறப்பியல்புகளைத் தெளிவுறுத்தல்
4. மரபு மற்றும் புதுக்கவிதைகளின் நோக்கினையும் போக்கினையும் கற்பித்தல்
5. பேச்சுக்கலை தொடர்பான திறன்களை மாணவர்களிடம் வளர்த்தெடுத்தல்

Course Outcomes

1. பக்தி இலக்கியத்தின் இறைச் சிறப்புகளை மாணவர்கள் நன்கு அறிந்திருப்பர்
2. காப்பிய இலக்கியங்களின் தனிச்சிறப்புகளைத் தெளிவாகக் கற்றிருப்பர்
3. உரைநடை இலக்கியங்களின் இன்றைய நிலையினை நன்கு விளங்கியிருப்பர்
4. மரபு மற்றும் புதுக்கவிதையின் தோற்றத்தையும் வளர்ச்சியையும் அறிந்து கவி புனையும் ஆற்றலை வளர்த்திருப்பர்
5. பேச்சு தொடர்பான திறனை நன்கு வளர்த்திருப்பர்

Unit-I	UNIT TITLE அலகு 1 - பக்தி இலக்கியம் திருஞானசம்பந்தர் – தோடுடைய செவியன் பதிகம் ஆண்டாள் – திருப்பாவை (முதல் பத்து பாசுரங்கள்) சீறாப்புராணம் – விடமீட்டுப் படலம் தேம்பாவணி – பைதிரம் நீங்கு படலம்	4-- Hours
Unit-II	UNIT TITLE அலகு 2 - காப்பிய இலக்கியம் கம்பராமாயணம் – மரமரத்துப் படலம் சீவகசிந்தாமணி – நாமகள் இலம்பகம் (ஏமாங்கத நாட்டு வளம்)	4-- Hours
Unit-III	UNIT TITLE அலகு 3 - உரைநடை இணையம் கற்போம் – மு.இளங்கோவன் , சுற்றுச் சூழல் கல்வி	4-- Hours

Unit-IV	UNIT TITLE அலகு 4 - கவிதைகள் (மரபு, புதுமை) பாரதியார் – செந்தமிழ் நாடென்னும் போதினிலே பாரதிதாசன் – புரட்சிக்கவி புதுக்கவிதை, ஹைக்கூ, சென்ரியு, லிமைரைக்கூ	4-- Hours
Unit-V	UNIT TITLE அலகு 5 - பேச்சுக்கலை பேச்சுக்கலை ஓர் அறிமுகம் தமிழ்த்தென்றல் திரு.வி.க., பேரறிஞர் அண்ணா, கலைஞர் மு.கருணாநிதி	4- Hours
Books for Study: அடித்தளப்படிப்பு – தமிழ் – முதலாமாண்டு இரண்டாம் பருவம்		
Books for Reference: 1. பக்தி இலக்கியம் 2. கம்பராமாயணம் 3. சீவகசிந்தாமணி 4. இணையம் கற்போம் – மு.இளங்கோவன் 5. பாரதியார் கவிதைகள் 6. பாரதிதாசன் கவிதைகள் 7. பேச்சுக்கலை – ம.திருமலை 8. தமிழ் இலக்கிய வரலாறு – மு.வரதராசனார் 9. தமிழ் இலக்கிய வரலாறு – ச.வே.சுப்ரமணியன்		

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI

PROGRAMME OUTCOME FOR B.A. ENGLISH

- PO1 Communicate in English, ideas, thoughts & knowledge effectively in conversations, and meetings & especially in a Digital environment. Develop linguistic skills in one Indian/Regional language
- PO2 Demonstrate domain-specific knowledge and its applications in real-life situations
- PO3 Synthesize learned knowledge and skills to effectively and efficiently perform the job duties of a profession
- PO4 Critically evaluate a situation and suggest a solution after careful consideration of the alternatives
- PO5 Exhibit potential to accomplish tasks independently or as a member or leader of a team
- PO6 Plan and Execute a Project after careful evaluation of the activities involved
- PO7 Develop products, Design Policies, and/or collaborate to help Society in building a Sustainable Environment
- PO8 Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT
- PO9 Demonstrate ability towards critical thinking about his role as a responsible citizen
- PO10 Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

PROGRAMME SPECIFIC OUTCOME

- PSO1** Identifies the economic and social conditions with societal belief.
- PSO2** Compares the moral superiority of life in the urban and countryside.
- PSO3** Relates the language scientific and non-scientific way of doing things.
- PSO4** Discovers why people are complicit with their ideological constructions

- PSO5** Uses the empirical methods to the poetic language
- PSO6** Categorizes the fiction and non-fiction books
- PSO7** Connects the language as study of reasoning and theory of language.
- PSO8** Writes effectiveness of rational inquiry, logical and empirical investigations.

MAPPING OF **PROGRAMME SPECIFIC OUTCOMES** WITH **PROGRAMME OUTCOMES**

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO2	✓	✓		✓	✓	✓	✓	✓		
PSO3	✓	✓	✓	✓	✓	✓	✓	✓		
PSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO5	✓	✓		✓	✓	✓	✓	✓	✓	
PSO6	✓	✓	✓	✓	✓	✓		✓		
PSO7	✓	✓	✓	✓	✓	✓	✓	✓		✓
PSO8	✓	✓	✓	✓	✓	✓	✓		✓	✓
Number of matches = 68 , Correlation: Very High										

Mapping correlation benchmark				
Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

DEPARTMENT OF ENGLISH
UG & PG SYLLABI

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HOURS	CREDIT
UBFEN101	GE2	ENGLISH I	4	4
Course Objectives				
1. To inculcate habit of reading, moral and social values through select English prose.				
2. To comprehend nature and ignite imagination through poetic verses.				
3. To enhance students’ personality through personal traits.				
4. To acquaint them with situational dialogues.				
5. To acquire the knowledge of basic grammar and implement language skills.				
Unit-I	PROSE			12 Hours
A.P.J. Abdul Kalam: My Visions for India				
Oscar Wilde : The Happy Prince				
Hardin B. Jones : Dangers of Drug Abuse				
O’Henry : The Cop and the Anthem				
Unit-II	POETRY			12 Hours
John Keats: La Belle Dame Sans Merci				
John Greenleaf Whittier: Don’t Quit				
Rudyard Kipling: If				
Gabriel Okara: Once Upon a Time				
Unit-III	SOFT SKILLS			12 Hours
Personal Traits: Truth, Honesty, Integrity, Accountability, Transparency, Punctuality, Sincerity				
Unit-IV	WRITING& SPEAKING SKILLS			12Hours
1. Formal and Informal Letters				
2. Conversational Phrases				
3. Situational Dialogues: Doctor- Patient, Teacher- Student, Salesman- Customer, Conductor- Passenger				
Unit-V	BASIC GRAMMAR			12 Hours
Parts of Speech: Noun-Pronoun-Verb-Adverb				
Three forms of verb				
Articles				
• Language Lab: Weekly one hour.				
Books for Study:				
1. Foundation English text book printed by Islamiah College Publications.				

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Read the English prose and comprehend the moral and social values.	K1
CLO2	Paraphrase and interpret the poems.	K2
CLO3	Categorize personal traits and develop their personality.	K4
CLO4	Articulate dialogues on their own in a given situation.	K3
CLO5	Rewrite the sentences using basic grammar.	K6
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

SEMESTER I				
Course Code	Category	Course Title	Hours	Credit
UBVED101	AEC	VALUE EDUCATION	2	1
Course Objectives				
1. To comprehend the significance of values 2. To equip learners on family values 3. To assess moral values in society 4. To evaluate the merits of health, mind, aestheticism, and spiritualism 5. To teach students on the status of women in their families. 6. To raise awareness about anger management and the emancipation from drug and cell phone addiction.				
Unit-I	DEFINITION AND IMPORTANCE OF VALUES			6 Hours
1. Definition of Values and value education- Need for value education 2. Building up values among students- Maintaining decorum of the campus 3. Evil effects of ragging- keeping the campus clean and green				
Unit-II	VALUES IN RELIGION			6 Hours
1. Spiritual values- Introduction to religious values 2. Need for religious harmony 3. Universal brotherhood in religion				
Unit-III	PERSONAL DEVELOPMENT			6 Hours
1. Physical exercise- health diet- free from drug and mobile addiction- Anger management- Self-discipline- honesty- courage 2. Values in family life- Parent children relationship- Maintaining good relationship in family 3. Values in social life- Protecting the rights of women and children – Helping uncared elderly people				

Unit-IV	ROLE OF GOVERNMENT	6 Hours
1. Constitutional values- Justice, Equality, Freedom and Human dignity. 2. Awareness about politics- Issues of caste, class and religion- Eliminating corruption- Eradicating poverty, unemployment, Illiteracy and inequality 3. Ensuring access to food, shelter, education, health care, and a peaceful existence		
Unit-V	SERVICE TO HUMANITY	6 Hours
1. Positive thinking- Awareness about global issues- Environmental Issues – Global warming 2. Principles of non-violence and solidarity 3. Working as a volunteer in extension programs- Blood donation- Volunteering during natural disasters 4. Obeying Traffic Rules		
Books for Study: 1. Value Education: M. Uma Maheswari& K.R. Lakshmi Narayanan, NanilamPathipagam, 2. Social Values among Young Adults: A Changing Scenario by M.S. Das and Gupta		
Books for Reference: 1. Serving Humanity: AliceBailey . United Kingdom, Lucis Publishing Company, 1987. 2. Personality Development: Swami Vivekananda, AdvaitaAshrama, Kolkata, 2008 3. Six Attitudes of Winners: Norman Vincent Peale, Jaico Publishing House, Mumbai, 2009.		

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Illustrate and paraphrase the significance of values and culture.	K1, K2
CLO2	Take part in constructing a peaceful society.	K4
CLO3	Practice the duties of socially responsible students and citizens and propagate unity in diversity	K3
CLO4	Design their words and actions based on moral values.	K6
CLO5	Evaluate the link between values and human rights.	K5
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
UBEN1001	DSC1	INDIAN LITERATURE IN ENGLISH	7	6

COURSE OBJECTIVES		
1. To get the glimpse of later part of the 18th century which had witnessed the need for English education in India? 2. To understand the works of social reformists who had stirred the mindset of populations on topics like women's emancipation and their voting rights. 3. To create awareness of diverse literary cultures of India 4. To understand the true devotion and dedication in human life 5. To analyze the socio and economic problems of the past		
Unit-I	POETRY	12 Hours
1. Rabindranath Tagore: Leave this Chanting Paper Boats 2. Jayanta Mahapatra : The Hunger 3. Nissim Ezekiel: The Professor		
Unit-II	SHORT STORY	12 Hours
1. Prem chand : Catastrophe 2. R.K. Narayan: A Snake in the Grass		
Unit- III	PROSE	12 Hours
1. M.K. Gandhi : My Experiment With Truth (Chapter -At School) 2. S. Radhakrishnan: The World Community		
Unit-IV	DRAMA	12 Hours
1. Mahesh Dattani :Seven Steps Around the Fire		
Unit-V	FICTION	12 Hours
1. Bapsi Sidhwa: The Ice-Candy Man		
Books for Study: 1. W.B. Yeats Gitanjali by Rabindranath Tagore, Sterling Publishing Pvt.Ltd, 2007 2. M.K. Gandhi, My Experiment with Truth, Finger Print Publishing, 2001.		

3. Mahesh Dattani, Seven Steps Around the Fire, Penguin Publishing, 2013.

4. Ice Candy Man, Bapsi Sidhwa, Penguin Publishers, 1988

Books for Reference:

1. K.R.SrinivasAiyenger : Indian Writing in English, Sterling Publishers, New Delhi.
2. M.K.Naik – A History of Indian English Literature, SatityaAkademi, New Delhi.
3. H.M.Williams – Indo-Anglian Literature 1800-1970 : A Survey, Orient Longman, Chennai.

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Familiar with the glimpses of later part of the 18 th century.	K1, K2
CLO2	Evaluate the Indian writers' Literary sense	K4
CLO3	Understand the works of social reformist	K5
CLO4	Create an awareness about women's emancipation	K6
CLO5	Organize an ideal social set up inferred from the ideas of the writers.	K3
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓		✓			✓
CLO2	✓		✓		✓	✓		
CLO3	✓	✓			✓		✓	✓
CLO4	✓				✓	✓		✓
CLO5	✓	✓	✓				✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/WEEK	CREDIT
UBSKB101	SEC 1	PROFESSIONAL COMMUNICATION FOR ARTS AND SOCIAL SCIENCES.	3	3
Course Objectives:				
1.To develop the language skills of students by offering adequate practice in professional Contexts.				
2.To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year Social sciences students				
3. To Connect the language as study of reasoning and theory of language.				
4. To focus on developing students’ knowledge of domain specific registers and the required Language skills.				
5. To develop the knowledge of the Coinage of India and highlight the important Inscriptions of Ancient India.				
Unit-I	FREELANCE WRITING			8 Hours
2. Speaking				
a. Clear articulation				
b. Engaging presentation style				
c. Avoiding filler words				
d. Speaking slowly and clearly				
e. Pausing between ideas				
3. Listening				
a. Words and Definitions				
https://englishvids.teachable.com/courses/free/lectures/4835582				
b. Do so - Meaning and examples				
https://englishvids.teachable.com/courses/free/lectures/4902990				
c. ‘Hardly’ and ‘no sooner’				
https://englishvids.teachable.com/courses/free/lectures/4903003				
d. Idioms and Definitions				
https://englishvids.teachable.com/courses/free/lectures/4907442				
4. Reading				
a. Reading Comprehension – Fluency, Vocabulary, Inference, Retention				
b. Previewing the texts				
c. Key Reading Strategies				
d. Summarizing				
5. Grammar				
a. Present Perfect Tense				
b. Present Perfect Continuous Tense				
6. Writing				
a. Writing Invitations				
b. Film Reviews				
c. Travelogue				
d. A letter to a friend about a recent adventure				
Unit-II	ADVERTISING AND BRANDING			7 Hours
2. Speaking				

	Creativity Different Opinions Talking about recent trends in advertising 3. Listening Retention while listening Notes taking while listening Giving feedback Analysis of two different promoters 4. Reading a. Five shopper insights fundamentals that still apply https://www.quirks.com/articles/five-shopper-insights-fundamentals-that-still-apply b. Shifting focus to brand purpose https://www.quirks.com/articles/in-a-crisis-marketers-must-shift-focus-to-brand-purpose c. Internal Stakeholders https://www.quirks.com/articles/how-to-approach-behavioral-research-results-with-internal-stakeholders d. Tips for brands facing a challenging economy https://www.quirks.com/articles/3-research-tips-for-brands-facing-a-challenging-economy e. Brand Empathy for Re-building Customer Confidence https://www.quirks.com/articles/how-brand-empathy-can-rebuild-consumer-confidence 5. Grammar a. Past Perfect Tense b. Past Perfect Continuous Tense 6. Writing a. Writing messages for a picture b. Writing audio script for a 10-20 second advertisement video c. Brochure Writing	
Unit-III	PUBLIC RELATIONS	7 Hours
	2. Speaking a. Sharing your work https://www.ted.com/talks/erin_baumgartner_big_data_small_farms_and_a_tale_of_two_tomatoes 3. Listening a. Preparing a pitch https://www.youtube.com/watch?v=Njh3rKoGKBo b. The Structure of Great Talks https://www.ted.com/talks/nancy_duarte_the_secret_structure_of_great_talks?referrer=playlist-how_to_make_a_great_presentation	

	4. Reading a. Newspaper Reading b. Excerpts from Magazines 5. Grammar a. Future Perfect Tense b. Future Perfect Continuous Tense 6. Writing a. Preparing Media Statements b. Blog Posts c. College Day Press Release	
Unit-IV	Introduction to Numismatics: Definition, Nature and Scope of Numismatics- Barter System – Punch marked Coins- Indo Greek Coins- Coinage of Mauryan- Coinage of Kushans- Coinage of Gupta's- Coinage of Delhi Sultans- Coinage of Mughal's-Coinage of British- Coinage of Contemporary India.	7 Hours
Unit-V	Introduction to Epigraphy -Definition, Nature and Scope of Epigraphy- Select Inscriptions –Erragudi –Edict of Asoka –Junagarh Inscription of Rudradaman-Hathigumpa Inscription of Kharavela- Nasik Inscription of Gautami Balasri-NanaghatInsription of Naganika Allahabad Pillar Inscription of Samudra Gupta –Mehrauli Inscription of Chandragupta-II.	7 Hours
Books for Study: 1. https://www.indeed.com/career-advice/career-development/how-to-improve-reading-skills 2. https://www.quirks.com/articles/specialties/advertising-research 3. https://ohiostate.pressbooks.pub/stratcommwriting/chapter/the-role-of-writing-in-public-relations/ 4. Allen john - <i>Catalogue of Coins of Ancient India</i>, British Museum, London, 1936. 5. Altekar A.S - <i>Coinage of the Gupta Empire</i>, Numismatics Society of India, Varanasi,1957. 6. 4. K.V. Raman, <i>Principles and Methods of Archaeology</i>, Parthajan Publications, Chennai, 1998		
Books for Reference: 1. https://www.verywellmind.com/public-speaking-skills-3024308#delivery 2. https://www.thebalancecareers.com/public-speaking-skills-with-examples-2059697 3. https://learnenglishteens.britishcouncil.org/skills/writing/elementary-a2-writing 4. https://learnenglishteens.britishcouncil.org/skills/writing/intermediate-B1-writing 5. https://www.youtube.com/watch?v=Njh3rKoGKBo 6. 1.Chattopadhyay S, <i>Coins and Icons- A study of Myths and Symbols in</i> 7. <i>IndianNumismaticsArt</i>,PanthiPustak, Calcutta ,1977.		

CLO	COURSE LEARNING OUTCOMES
	By the end of the course, the students will be able to converse accurately
CLO1	Recognise their own ability to improve their own competence in using the language
CLO2	Use language for speaking with confidence in an intelligible and acceptable manner
CLO3	Articulates the importance of reading for life
CLO4	Designs the importance of Coins in Ancient India.
CLO4	Rewrites the said fable with concrete evidence.

SEMESTER I				
Course Code	Category	Course Title	Hours	Credits
UBENAL11	Other Elective Course	LITERARY FORMS	7	5
Course Objectives				
1. To grasp the basics of literature 2. To comprehend literature's technical framework 3. To understand how literary works are categorized. 4. To nurture a love of literature by reading 5. To recognize and appreciate its various forms and genres				
Unit-I	POETRY		21 Hours	
Lyric, Ode, Sonnet, Elegy, Epic, Ballad, Mock-Epic, Idyll, English Prosody, Free Verse, Blank verse, Haiku poetry, Literary devices: Alliteration, Rhyme scheme, Personification, Metaphor, Simile, Imagery, Synecdoche, Repetition, Oxymoron, Hyperbole, Refrain.				
Unit-II	NOVEL		21 Hours	
Novel, Detective Novels, Dramatic Novels, Picaresque Novel, Psychological Novel and Historical Novel Literary devices: Plot, setting, style, theme, allegory, and parody				
Unit-III	DRAMA		21 Hours	
English Tragic Plays, Comic Plays, Tragic-Comedies, Melo drama, One Act play Literary devices: Satire, Mime, Pantomime, Dramatic Irony, Paradox, Aside, Soliloquy, Hamartia, Imagery, Foreshadow, Farce and Masque				
Unit-IV	ESSAY		21 Hours	
Expository Essays, Descriptive Essays, Narrative Essays and Argumentative Essays				
Unit-V	SHORT STORY, BIOGRAPHY, AUTOBIOGRAPHY		21 Hours	

Short Story: Anecdote, Fable, Frame Story, and Vignette
Biography & Autobiography

Books for Study:

1. A Glossary of Literary Terms, M.H. Abrahams
2. The Routledge History of Literature in English, Ronald Carter
3. The book of Literary Terms, Lewis Tueco

Books for Reference:

1. William Henry Hudson: An Introduction to the Study of Literature, Kalayani Publishers, Ludhiana
2. Birjadesh Prasad: A Background to the Study of English Literature (Revised Edition); Macmillan Company, Chennai.
3. R.J.Rees: English Literature – An Introduction for foreign Readers, Macmillan, London.
4. K.R.Srinivasayengar and Prema Nandakumar: Introduction to the Study of English Literature; Asia Publishing House, Bombay.
5. <https://www.lovereadings.co.uk/genre/ghf/Historical-Fiction.html>

CLO	COURSE LEARNING OUTCOMES: THE STUDENTS WILL BE ABLE TO	KNOWLEDGE LEVEL
CLO1	Define the essential literary forms in literature	K1
CLO2	Sketch the literary terms in a given text	K3
CLO3	Paraphrase the gist of poetry, play, novel, and short story.	K2
CLO4	Contrast and correlate the literary genres, fiction and non-fiction.	K4
CLO5	Write the appreciation of literary texts.	K6
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓				✓	✓
CLO2	✓	✓	✓		✓	✓	✓	✓
CLO3	✓	✓	✓		✓		✓	✓
CLO4	✓		✓	✓	✓			
CLO5	✓	✓	✓		✓		✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBFEN201	GE4	ENGLISH II	4	4
Course Objectives				
1. To inculcate habit of reading, moral and social values through select English prose. 2. To comprehend nature and ignite imagination through poetic verses. 3. To develop interpersonal skills. 4. To give an exposure to writing and speaking skills. 5. To impart the knowledge of basic grammar and implement language skills.				
Unit-I	PROSE			8 Hours
Munshi Premchand: Idgah James Thurber : University Days R.K. Narayan : Another Community Robert Lynd : Forgetting				
Unit-II	POETRY			8 Hours
P.B. Shelley: Ozymandias Robert Frost: Stopping by Woods on a Snowy Evening Emily Dickinson: Because I could stop for Death David Rubadiri : A Negro Labourer in Liverpool				
Unit-III	SOFT SKILLS			7 Hours
Willingness to take instructions and responsibilities- Cooperation- Team Skills- Interpersonal skills				
Unit-IV	WRITING & SPEAKING SKILLS			7 Hours
1.Comprehension 2. Hints developing 3. Picture description 4. Interview skills (Personal appearance, body language, group discussion, mock interview)				
Unit-V	BASIC GRAMMAR			6 Hours
Parts of Speech: Adjective, Preposition, conjunction and Interjection. Tenses Voice Reported Speech				
Books for Study:				
1. Foundation English text book printed by Islamiah College Publications.				

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Relate and summarize the English prose and comprehend the moral and social values.	K1,K2
CLO2	Relate and correlate nature with the life through poetry.	K4
CLO3	Apply interpersonal skills in day to day life.	K3
CLO4	Develop descriptive writing and interview skills.	K6
CLO5	Reframe and Rewrite the sentences using voice and reported speech.	K5
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Course Code	Category	Course Title	HRS/ WEEK	CREDIT
UBENV201	AEC2	ENVIRONMENTAL STUDIES	2	1
Course Objectives				
1. To promote the linguistics competence into the minds of the young learners through teaching the basics of English. 2. To acquaint them with family values. 3. To educate learners status of women in family. 4. To establish awareness on anger management. 5. To acquaint the learners with ethics and leadership qualities				
COURSE LEARNING OUTCOME:				
1. Establish contexts for the learners to make a right moral judgment 2. Cultivate their minds to adopt the values 3. Enable the learners to reflect on issues and develop the right attitude to address them 4. Cultivate compassion and responsibility with themselves and people around them 5. Recognize and uphold human, social and global values				
Unit-I	NATURE AND ENVIRONMENTAL			5 Hours
Definition-Scope-Awareness				
Unit-II	ECOSYSTEMS			5 Hours
Types of Ecosystem: Forest-Grassland-Desert and Aquatic				
Unit-III	SOCIAL ISSUES AND THE ENVIRONMENT			5 Hours
Sustainable-Unsustainable developments-Water conservation-Rain water harvesting- Environmetal ethics				
Unit-IV	HUMAN POPULATION AND ENVIRONMENT			5 Hours
Population growth-Population and Health-Human rights and Environment				
Unit-V	FIELD WORK			4 Hours
Visit to a local area –Visit to our college Herbal Garden-Study of common plants in our College Campus-				
Books for Study:				
1. Environmental Studies, Bishop Heber College, Tiruchirappalli, Tamil Nadu, India 2. Sengupta,R.2003.<i>Ecologyandeconomics:Anapproachtosustainabledevelopment</i>.OUP. 3. Singh,J.S.,Singh,S.P.andGupta,S.R.2014.<i>Ecology,EnvironmentalScienceandConservatio n</i>.S.Chand Publishing, NewDelhi. 4. Sodhi,N.S.,Gibson,L.&Raven,P.H.(eds).2013.<i>ConservationBiology:VoicesfromtheTro pics</i>.John Wiley &Sons. 5. Thapar,V.1998.<i>LandoftheTiger:ANaturalHistoryoftheIndianSubcontinent</i>.				
Books for Reference:				
1. Carson, R. 2002. <i>Silent Spring</i>. Houghton MifflinHarcourt. Gadgil,M.,& Guha,R.1993.<i>ThisFissuredLand:AnEcologicalHistoryofIndia</i>.Univ.of CaliforniaPress. 2. Gleeson,B.andLow,N.(eds.)1999.<i>GlobalEthicsandEnvironment</i>,London,Routledge. 3. Grumbine,R.Edward,andPandit,M.K.2013.ThreatsfromIndia’sHimalayadams.<i>Science</i>,339:36-37.				

4. McCully, P. 1996. *Rivers no more: the environmental effects of dams* (pp. 29-64). Zed Books.
5. McNeill, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.

SEMESTER				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBVBC201	VALUE BASED COURSE	PHYSICAL EDUCATION SPORTS - I	1	1
Course Objectives 1.To Understand The Aim And Objectives of Physical Education. 2.To Make The Students Gain The Skill on Cardio Respiratory Performance And Maintaining The Fitness. 3.To Impact The Knowledge Among The Students To About Physical Activity And Health And Fitness Benefits of Sports.				
UNIT-I	Principles and foundation of physical education, guidance and counseling			3 Hours
• Introduction- Meaning, Definition And Scope Of Physical Education-Aims And Objective Of Physical Education-Importance Of Physical Education- • Foundation Of Physical Education-Idealism Pragmatism, Naturalism, Realism, -Fitness And Wellness Movements • Principles Of Physical Education-Growth And Development-Age And Gender Characteristics-Body Types				
Unit-II	Rules And Regulation Of Sports & Games			3 Hours
• Introduction The Games- History –Rules And Regulation For All Games-(Volley Ball – Foot Ball –Cricket-Hand Ball-Badminton-Kabbadi-Kha-Kho) Games And Officiating Measurement. • Introduction The Sports –History –Rules And Regulation For All Sports –(Athletic Events-Running Events-Throwing Events-Jumping Events) Officiating And Measurement.				
Unit-III	Sports Nutrition And Weight Management			3 Hours
• Introduction To Sports Nutrition-Meaning And Definition Of Sports Nutrition-Basic Nutrition Guidelines-Role Of Nutrition In Sports- • Nutrition And Weight Management-Meaning Of Weight Management Concept Of Weight Management In Modern Era Factor Affecting Weight Management And Values Of Weight Management –Concept Of BMI(Body Mass Index)				
Unit-IV	Anatomy And Physiology			3 Hours
• Anatomy Of The Human Body-Brief Introduction Of Anatomy And Physiology In The Field Of Physical Education- Introduction Of Cell And Tissue.-Types Of Muscles. • Important Organs And System-Blood And Circulatory System.Constituents Of Blood And Their Function-Blood Groups And Blood Transfusion, Clotting Of Blood, The Structure Of The Heart-Properties Of The Heart Muscle, Circulation Of Blood.Cardiac Cycle, Blood Pressure Cardiac Output.				

Unit-V	Sports Management	3 Hours
• Introduction-Nature And Concept Of Sports Management –Event Management In Physical Education And Sports-Sports Marketing • Leadership-Meaning And Definition Of Leadership-Leadership Style And Method. • Sports Programme At School ,College,University-Factors Affecting Planning-Controlling A School,College And University Sports Programme.		
Books For Study 1.Physical Education Book –Sports And Exercise Nutrition –William D Mcardle,-Lippincott Willams &Wilkins 2012 2. Physical Activity For Health And Fitness – Allen Jackson,-Champaign IL.Human Kinetics 2003		
Books For Reference: 1.Bucher,C.A (N.D)Foundation Of Physical Education .St.Louis:The C.V.Mosby Co. 2.Bassesen,D.H.(2008)Update On Obesity.J.Clinendocrinometab.93(6)2027-2034. 3.Demaria,E.J.(2007)Bariatric Surgery For Morbid Obesity.N.Engl J Med,356(21),2176-2183.		
Course Learning Outcomes The Students Clo 1 Will Be Able To Understand History Of Physical Education Clo 2 Will Be Gain The Knowledge Above Games & Sports Clo 3 Will Be Able Tounderstand The Importance Of Nutritions Required For Maintaining The Fitness Of Body Clo 4 Will Be Gain The Leadership Quality Skill. Clo 5 Will Be Able To Acquire The Knowledge On Anatomy		

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBVBC202	Value-Based Course	Health & Wellness	1	1
Course Objectives: 1. Identify current health issues and explain their influence on physical, mental and emotional well-being. 2. Construct and analyze a personal health profile and develop a plan to improve one's health related behavior.				
Unit I	Fitness & Wellness			3 Hours
Introduction – Fitness & Wellness. Healthy Lifestyles. Health Appraisals. Health Assessment Tools.				
Unit II	Health Management			3 Hours
Weight Management. Cardiovascular Endurance. Infection Process and Environmental Control Communicable and Acute Diseases.				
Unit III	Safety Management			3 Hours

Nutrition. Muscular Fitness. Creating Quality Environments. Safety Management Management of injuries and Acute Illness		
Unit IV	Nutrition	3 Hours
Nutrition – definition, importance, nutrition and mal nutrition; Balanced Diet: Basics of Meal Planning		
Unit V	Hygiene	3 Hours
Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (Water, Sanitation and Hygiene) programme.		
Books for study:		
1. Wellness: Concepts and Applications, Anspaugh, Hamrick, and Rosato. McGraw-Hill, 7th edition, 2006. 2. Food Science – B. Srilakshmi, 6th edition, New Age International Publishers, 2018. 3. Food & Nutrition (Vol I, Second Edition) Swaminathan (1995) The Bangalore Printing & Publishing Co Ltd., Bangalore		
Books for References:		
1. Textbook of Human Nutrition (3rd edition) Bamji, M.S., K. Krishnaswamy & G.N.V. Brahmam Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 2009. 2. Food, nutrition & health, Vijaya Khader Kalyan Publishers, New Delhi, 2000. 3. ACSM's "Health Related Physical Fitness Assessment Manual Lippincott Williams and Walkins USA, 2005. 4. Concepts of Fitness and Welfare Boston Corbin, Charles Beetal. C.A, McGraw Hill., 2004.		
Course Learning Outcomes (CLOs)		
<i>By the End the Course, the Students will be able to</i>		
CLO1. Identify positive physical, mental, environmental, intellectual, spiritual, and social wellness.		
CLO2. Identify factors that are effective in promoting health and wellness.		
CLO3. Recognize risk factors that prevent optimum wellness..		
CLO 4. Identify and establish goals to modify current lifestyle choices.		
CLO 5. Identify and implement lifestyle changes that may enhance lifelong health.		

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
UBEN2001	DSC3	FICTION	5	4
COURSE OBJECTIVES				
1. To get a quick glance of the 19th century 2. To creation interest in literary works ranging from novel, short story and magazine. 3. To evoke an emotional response among the students, 4. To analyze the social problems of the day caused by industrialization and the urbanization of the working classes. 5. To interpret the critical ideas and values				
Unit-I				5 Hours
Rise of the Novel				
Types of Novel				

Unit-II		5 Hours
Daniel Defoe	-Robinson Crusoe	
Samuel Richardson	-Pamela	
Unit-III		5 Hours
George Orwell	- Animal Farm	
Unit-IV		5 Hours
Thomas Hardy	- Mayor of the Casterbridge	
Unit-V		4 Hours
Charles Dickens	- Oliver Twist	
Books for Study: 1. Samuel Richardson, Pamela, Dover Publisher, 2015. 2. Daniel Defoe, Robinson Crusoe, Fingerprint 2013 3 George Orwell, Animal Farm, Penguin, 2011. 4. Thomas Hardy, Mayor of the Casterbridge, Penguin, 2003.. 5. Charles Dickens, Oliver Twist, Penguin, 2004.		
Books for Reference: 1. Kumar, Shiv K. & KethMcKean Critical Approaches to Fiction. Atlantic 2014. 2. Head, Dominic The Cambridge Introduction to Modern British Fiction 1950-2000 Cambridge 2005.		
CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Read notable 19 th century creation of literary work.	K1, K2
CLO2	To develop literary emotional responses	K4
CLO3	To apply social problems of industrialization of 19 th to the present day	K5
CLO4	To compare the urbanization of the working classes of the past and present century.	K6
CLO5	To organize an ideal social set up inferred from the ideas of the writers.	K3
	K1-Remembering/knowledge, K2-Understand, K3-Apply, K4-Analyse, K5-Evaluate, K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course	Programme Learning Outcomes (PSOs)

Learning Outcomes (CLOs)	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓			✓			✓
CLO2	✓		✓		✓	✓		
CLO3	✓	✓			✓		✓	✓
CLO4	✓					✓	✓	✓
CLO5		✓	✓			✓	✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
UBEN2002	DSC4	ENGLISH PROSE	4	3
COURSE OBJECTIVES				
1. To acquaint the students with the thoughts of free flowing speeches of different writers. 2. To enable the students to connect with the different authors’ works. 3. To read with correct pronunciation, stress, intonation and articulation of voice. 4. To enrich active and passive vocabulary. 5. To understand the passage and comprehending its meaning.				
Unit-I	Classic Essays			3 Hours
Francis Bacon : Of Truth				
Francis Bacon : Of Parents and Children				
Francis Bacon : Of Great Place				
Unit-II	Poetry			3 Hours

Sir Philip Sidney : The defence of poesie, Political discourses, Correspondence		
Unit-III	Fiction	2 Hours
Charles Lamb : Tales from Shakespeare		
Unit-IV	Essay	2 Hours
*Joseph Addison : Sir Roger at the Church		
UNIT V	Prose	2 Hours
*A.P.J Kalam : Patriotism Beyond Politics and Religion (from Our Ignited Minds)		
Books for Study/Online Materials: 1. Narain's Bacon's Essays by Lahiri Ganguli, India. 2. A Defence of Poesie and Poems by peacock books, Rupa Publications, India. 3. Charles & Mary Lamb: Tales From Shakespeare; Fingerprint! Publishing, India. 4. Selected Essays of Joseph Addison; Nabu Press, Charleston, South Carolina. 5. Wings of Fire: An Autobiography of Abdul Kalam, University Press, India. 6. https://mrgac.ac.in/elearning-portal/ec/admin/contents/75_P16EN13_2020121604195597.pdf 7. https://www.youtube.com/watch?v=Cb7Ibraalm4		

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Compare and contrast the works of different writers.	K1,K2
CLO2	Infer with the ideas of different authors.	K2
CLO3	Analyze ideas associated with human relationships for prospective development.	K4
CLO4	Evaluate from life experience that desire and happiness are just a little proportion.	K5
CLO5	Create the patriotism through prose	K6
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course	Programme Learning Outcomes (PSOs)

Learning Outcomes (CLOs)	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CLO1	✓	✓		✓	✓			✓	
CLO2	✓		✓		✓	✓			
CLO3	✓	✓		✓	✓		✓	✓	
CLO4	✓	✓	✓		✓	✓		✓	
CLO5		✓	✓			✓	✓	✓	
NUMBER OF MATCHES= 26 , CORRELATIONS: HIGH									

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
UBENAL21	OEC2	HISTORY OF ENGLISH LITERATURE – I (1350-1850)	5	4
COURSE OBJECTIVES				
1. To acquaint the students with the linguistic development of the language. 2. To understand the past history of all sections of the society from gentry to humble craftsmen. 3. To make the students to read out the selected passages aloud. 4. To interpret different style of writings. 5. To distinguish the different emotions and thoughts of prominent writers.				
Unit-I	THE AGE OF CHAUCER(1350-1450)			5 Hours
Literary Features of the Age His Life and His Poems Features of his Poetry Other Prominent Writers				
Unit-II	CHAUCER TO SPENCER(1450-1550)			5 Hours

Literary Features of the Age The Development of Literary Forms and Literary Style Other Prominent Writers		
Unit-III	THE AGE OF ELIZABETH(1550-1630)	5 Hours
Literary Features of the Age The Development of Literary Forms and Literary Style Pre-Shakespearian Drama, The University Wits William Shakespeare(1564-1616), Ben Jonson(1573-1637) to Cyril Tourneur(1557-1626) Francis Bacon (1561-1626) Other Prose Writers		
Unit-IV	AGE OF MILTON(1630-1660), RESTORATION(1660-1700)	5 Hours
The Metaphysical Poets The Cavalier poets Neo-Classicism John Dryden Restoration Comedy, Tragedy		
UNIT V	*Augustan and Romantics, *Augustan Literature (1700-1790), *The Romantics (1790-1837)	4 Hours
The Enlightenment; Pope, Addison, Swift. The novel, The emergence of Sensibility, The Age of Johnson. The Romantic poets, Romantic prose, Fiction – Walter Scott, Jane Austen		
Books for Study/Online Materials: 1. An Outline History of English Literature –Hudson. 2. http://tumkuruniversity.ac.in/ocug/lang/Neo%20classical%20age%20notes%201.pdf 3. https://staff.tiame.uz/storage/users/277/presentations/7aXCo70ep0tZesFERGluwPYtnwXGoPM4vGSWHc3r.pdf 4. https://www.youtube.com/watch?v=aFpNlb2LBfc 5. https://manavata.org/able/wp-content/uploads/sites/10/2020/07/A-History-of-English-Literature.pdf		
CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Gain knowledge of different historical events.	K1,K2
CLO2	Understand the history of English literature.	K2
CLO3	Analyze the ideas of different authors.	K4
CLO4	Evaluate literary terminologies.	K5
CLO5	Creating awareness about critical approaches.	K6
	K1-Remembering/knowledge, K2-Understand, K3-Apply, K4-Analyse, K5-Evaluate, K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓		✓	✓			✓
CLO2	✓		✓		✓	✓		
CLO3	✓	✓		✓	✓		✓	✓
CLO4	✓	✓			✓	✓		✓
CLO5		✓	✓			✓	✓	✓
NUMBER OF MATCHES= 25 , CORRELATIONS: HIGH								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

		SEMESTER II		
Course Code	Category	Course Title	HRS/WEEK	CREDIT
UBENAL22	OLC3	SOCIAL HISTORY OF ENGLAND	3	3
Course Objectives				
1. To Define the transforming influence of pre-history to the early modern England 2. To help students to summarize critically the impact upon the English society and its literature. 3. To connect the key themes which encapsulate the period 4. To categorize the full breadth of English life and Society 5. To design the major trends that have shaped English society				
PROGRAMME SPECIFIC OUTCOME				
Unit-I	THE EARLY HISTORY OF ENGLAND			8 Hours
	The Norman Kings The Plantagenet Family			
Unit-II	THE RENAISSANCE			7 Hours
	The Great Cultural Movement Renaissance Thinkers			
Unit-III	Restoration England(1660 to 1688)			7 Hours
	Social Life			

Unit-IV	THE INDUSTRIAL REVOLUTION	7 Hours
	The late eighteenth Century The early nineteenth Century	
Unit-V	THE DEVELOPMENT OF EDUCATION IN NINETEENTH CENTURY	7 Hours
	The Dame School The Charity School The Sunday School	
	Books and e-Books for Study: 1. The Social History of England by Padmaja Ashok, Orient Blackswan Private Limited 2011- First Publication 2011-Reprinted 2012(Four Times), 2016(Two times)Second Edition 2019 2. https://www.ebooks.com/en-us/series/great-medieval-thinkers/ 3. https://www.britannica.com/event/Industrial-Revolution#:~:text=Industrial%20Revolution%2C%20in%20modern%20history,other%20parts%20of%20the%20world. 4. https://www.bl.uk/romantics-and-victorians/articles/the-impact-of-the-french-revolution-in-britain 5. https://www.ippr.org/files/2017-10/1508402633_cej-wealth-in-the-21st-century-oct-2017.pdf	
	e-Books for Reference: 1. https://www.historyextra.com/period/anglo-saxon/difference-between-britain-england-brief-history/ 2. https://www.history.com/topics/renaissance/renaissance#:~:text=The%20Renaissance%20was%20a%20fervent,classical%20philosophy%2C%20literature%20and%20art. 3. https://www.history.com/topics/industrial-revolution/industrial-revolution 4. http://www.nationalarchives.gov.uk/pathways/citizenship/struggle_democracy/revolution.htm 5. https://www.nytimes.com/2020/04/30/movies/capital-in-twenty-first-century-review.html	

COURSE LEARNING OUTCOMES:

CLOs	On the completion of the programme the student will be able to recognizes transformation of old ideas to new ideas and appreciating the achievements of different cultures	KNOWLEDGE LEVEL
C01	Recognizing the transforming influence of pre-history to the present modern history of England	K1
C02	Interprets the impact upon the English Society and its literature.	K2
C03	Discovers how the present work culture can be contrasted with the past.	K3
C04	Grading the varieties of technological functions of the past to present.	K5
C05	Develops the accumulated knowledge of the past to future societies.	K6

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

COURSE OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)							
CLOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CLO1	✓	✓	✓	✓	✓	✓	✓	✓
CLO2	✓	✓	✓		✓	✓	✓	✓
CLO3	✓	✓	✓	✓	✓	✓	✓	
CLO4	✓	✓	✓	✓	✓	✓		✓
CLO5	✓	✓	✓	✓	✓	✓	✓	✓
NUMBER OF MATCHES= 37 , CORRELATIONS: VERY HIGH								

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1	Identifies the economic and social conditions with societal belief.
PSO2	Compares the moral superiority of life in the urban and countryside.
PSO3	Relates the language scientific and non-scientific way of doing things.
PSO4	Discovers why people are complicit with their ideological constructions
PSO5	Uses the empirical methods to the poetic language
PSO6	Categorizes the fiction and non-fiction books
PSO7	Connects the language as study of reasoning and theory of language.
PSO8	Writes effectiveness of rational inquiry, logical and empirical investigations.

Mapping Correlation Benchmark

MAPPING	1-25%	26-50%	51-74%	75-100%
MATCHES	1-10	11-20	21-30	31-40
CORRELATION	POOR	MODERATE	HIGH	VERY HIGH

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBEN1001	DSC1	BRITISH LITERATURE-I	6	5
COURSE OBJECTIVES				
1. To portray the picture of Chaucer's society. 2. To inspire the visual arts and literature. 3. To emphasize the theatre and music of the golden period of English. 4. To present the soul of the society. 5. To compare and contrast the issues through one of the literary genre.				
Unit-I	POETRY			18 Hours
Geoffery Chaucer :Prologue to the Canterbury Tales (The Knight, The Wife of Bath, * The Friar & The Monk) John Milton : Paradise Lost Book IX *Alexander Pope : The Rape of the Lock				
Unit-II	SONNETS AND ODES			18 Hours
William Shakespeare : Those hours, that with gentle work did frame John Donne : The Sun Rising John Keats :Ode to the Nightingale Percy Bysshe Shelley :Ode to the Westwind				
Unit-III	PROSE			18 Hours
Francis Bacon :Of Wisdom for a Man's Self * :Of Revenge Dr.Johnson :Life of Milton				
Unit-IV	DRAMA			18 Hours
John Webster :The Duchess of Malfi William Congreve :The Way of the World				
UNIT V	NOVEL			18Hours
John Bunyan : The Pligrim's Progress Jonathan Swift (1667-1745) :The Battle of the Books *D.H. Lawrence :Sons and Lovers				
Books for Study/Online Materials:				
1. Shakespeare's Sonnets: Revised. Ed. by Katherine Duncan – Jones 2. John Webster's The Duchess Of Malfi Ed. By Anand Prakash & K.M. Singh. 3. https://askliterature.com/prose/francis-bacon/of-revenge-by-sir-francis-bacon/ 4. https://literariness.org/2020/07/09/analysis-of-alexander-popes-the-rape-of-the-lock/ 5. https://study.com/academy/lesson/sons-and-lovers-by-dh-lawrence-summary-analysis-themes.html				

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Learners will get the knowledge of the literary ages.	K1, K2
CLO2	Understand the dramatic and theoretical development.	K2
CLO3	Apply the societal development of past and present	K3
CLO4	Analyze technique, culture and language	K4
CLO5	Evaluate psychological development of the people and society	K4,K5
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓		✓	✓			✓
CLO2	✓	✓			✓	✓		
CLO3	✓		✓	✓	✓		✓	✓
CLO4	✓				✓	✓		✓
CLO5		✓	✓			✓	✓	✓
NUMBER OF MATCHES= 24 , CORRELATIONS: MODERATE								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER-I

Course Code	CATEGORY	Course Title	HOURS	Credit
PBEN1002	Discipline Specific Core Course	INDIAN LITERATURE IN ENGLISH	6	5
COURSE OBJECTIVES				
1. Familiarize the students with the origins of Indian writing in English. 2. To introduce pioneers of Indian English literature via literary writings. 3. To enlighten students about gender, identity, diaspora, etc. 4. Instill an understanding of India's geographical, cultural, social, and political dimensions in our students. 5. To strengthen students' literary and language skills.				
Unit-I	ESSAYS		18 Hours	
The rise of Indian Writing in English- Impact of Nationalism on Indian English Poetry- Pre and Post- Independence Indian Writing in English- Partition fiction				
Unit-II	POETRY		18 Hours	
Nissim Ezekiel : Poet, Lover, Bird Watcher Tagore : They Call You Mad A.K. Ramanujam : A River Toru Dutt : Our Casuarina Tree				
Unit-III	PROSE		18 Hours	
B.R. Ambedhkar :Annihilation of Caste GauriViswanathan : The Beginning of English Literary Study				
Unit-IV	DRAMA		18 Hours	
Girish Karnad :Hayavadana Asif Currimbhoy : The Refugee Mahesh Dattani : Tara				
Unit-V	NOVEL		18 Hours	
AravindAdiga : White Tiger Kamala Markandaya : A Handful Of Rice Anita Desai : Fire on the Mountain Kushwant Singh : Train to Pakistan				
Books for Study/ Online Materials:				
1.B. R. Ambedkar, B.R. Annihilation of Caste. New Delhi: Bluemoon Books, 2000.				
2.Devy, G.N. After Amnesia: Tradition and Changes in Indian Literary Criticism. Hyderabad:				

Orient Longman and Sangam Books, 1992.

3. Naik, M.K. A History of Indian English Literature. Delhi: SahityaAkademi, 1992.

Books for Reference/ Online Materials:

1. Iyengar, Srinivas K.R. Indian Writing in English, New Delhi: Sterling Publishers Pvt. Ltd. 2009.

2. Edwards, Brent Hayes. The Uses of Diaspora: Social Text 66, vol. 19, No. 1, Spring 2001.

3. Vishwanathan, G. Masks of Conquest: Literary Study and British Role in India, New York: Colombia University Press, 1989.

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Define the origins of Indian writing in English.	K1, K2
CLO2	Analyze Indian writers' context and style.	K4
CLO3	Deal with issues of gender, identity, diaspora, and so on.	K5
CLO4	Categorize the uniqueness of various dimensions of Indian Literature in English	K4
CLO5	Apply the literary and communication skills in creating literary texts like poetry and short stories	K3, K6
	K1-Remembering/knowledge, K2-Understand, K3-Apply, K4-Analyse, K5-Evaluate, K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems.

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓		✓		✓	✓
CLO2		✓		✓	✓		✓	✓
CLO3	✓		✓					✓
CLO4		✓	✓			✓	✓	✓
CLO5		✓			✓	✓	✓	✓

Prepared by: **S. ABDULLAH SHAH ALAM**

Verified by: **B. AKBAR**

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBEN1003	Discipline Specific Core Course	AMERICAN LITERATURE	6	4
COURSE OBJECTIVES				
1. To introduce students to the major works of American authors and their intellectual philosophies 2. To portrait different periods and movements through American Literature 3. To increase the knowledge of the roots of American Literature 4. To cultivate the systematic approach for analysis 5. To discuss literary and dramatic aspects				
Unit-I	POETRY			10 Hours
Edgar Allan Poe : The Raven Emily Dickinson : I Heard a Fly Buzz when I Died :Success Counted Sweetest Robert Frost : After Apple Picking				
Unit-II	POETRY			10 Hours
E.E.Cummings : Any one lived in a pretty how town. Langston Hughes : I too Sing America Amiri Baraka : As Agony as Now				
Unit-III	PROSE			10 Hours
Henry James : The Art of Fiction Martin King Jr. : I have a Dream				
Unit-IV	DRAMA			9 Hours
Ernest Hemingway : The Old Man and the Sea Arthur Miller : After the Fall 1964				
Unit-V	NOVEL			9 Hours
Toni Morrison : Paradise 1997 Mark Twain : The Adventures of Huckleberry Finn				
Books for Study/ Online Materials:				
1. Ed. William J. Fisher An Anthology: American Literature of the Nineteenth Century Eurasia Publishing House Pvt. Ltd., New Delhi 2002. 2. Sullivan, Nancy The Treasury of American Poetry (Prescribed Poems) Doubleday & Co., Inc, NY 1978				

3 Mark Twain The Adventures of Huckleberry Finn Any Reputed Publisher
 4. Ed. Egbert S. Oliver An Anthology: American Literature 1890-1965 Eurasia Publishing House Pvt. Ltd., New Delhi 2002

Books for Reference/ Online Materials:

1. Hoffman Harvard Guide to Oxford 1979.
2. Daniel. Contemporary American Writing Oxford University Press
- 3 Ed. Subbian C An anthology of American Poems Emerald Publications 1987

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Explores American historical, cultural and formal issues.	K1, K2
CLO2	Gain knowledge about American literary world	K4
CLO3	Develop the critical approaches when dealing with text	K5
CLO4	Understand the features of individual works.	K6
CLO5	Get a working knowledge of the cultural and historical contexts of the works.	K3
	K1-Remembering/knowledge, K2-Understand, K3-Apply, K4-Analyse, K5-Evaluate, K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓				✓		✓
CLO2	✓		✓		✓	✓		
CLO3	✓	✓	✓		✓		✓	✓
CLO4	✓				✓	✓	✓	✓
CLO5		✓	✓			✓	✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBEN1004	Discipline Specific Core Course	WOMEN'S WRITING IN ENGLISH	6	4
COURSE OBJECTIVES				
1. To introduce learners to English literature written by women writers. 2. To explore key issues and debates in women's studies. 3. To assist students, explore the depth and diversity of women's literary creativity. 4. To present a collection of women's literature from various genres, geographical places, and ethnic groups. 5. To get an insight into the richness and diversity of female literary creativity.				
Unit-I	POETRY		18 Hours	
1. Maya Angelou : Phenomenal Woman 2. Sylvia Plath : Daddy 3. KishwarNaheed : I am not that Woman 4. ImtiazDharker : Minority				
Unit-II	PROSE		19 Hours	
1. Virginia Woolf: A room of one's own 2. Arundhathi Roy : The Algebra of Infinite Justice				
Unit-III	FICTION		18 Hours	
1. Alice Walker : The Colour Purple 2. GoguShyamala: Father may be an Elephant and Mother Only a Small Basket, But-				
Unit-IV	DRAMA		19 Hours	
1. Henrick Ibsen : A Doll's House 2. Caryl Churchill : Top Girls 3. Mahasweta Devi : Ruddi 4. Vinodini : Thirst				
UNIT V	THEORY		18Hours	
1. Dr. Vandana Siva: Empowering Women 2. Bell Hooks: Black Women and Feminism 3. Simon de Beauvior: Myth and Reality from <i>The Second Sex</i> 4. Arundhathi Roy : The Algebra of Infinite Justice				
Books for Study/Online Materials:				
1. Hooks, Bell. Feminist Theory from Margin to Center. London: Pluto Press, 2000. 2. https://likeawhisper.files.wordpress.com/2009/03/empoweringwomen.pdf 3. Tharu, Susie & K. Lalitha. <i>Women Writing in India: 600 BC to the Present</i> . New York: The Feminist Press at CUNY, 1993. 4. Roy, Arundhati. <i>The Algebra of Infinite Justice</i> . New Delhi: Penguin, 2013				

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Define the factors such as race, gender, disability, class, and ethnicity.	K1, K2
CLO2	Correlate the texts to historicist, feminist, and other feminist criticism.	K4
CLO3	Appraise a text from the perspectives of gender and intersectionality.	K5
CLO4	Engage in intellectual discourse pertaining to gender.	K6
CLO5	Identify cultural history of women's literature via critical analysis.	K3
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓		✓			✓
CLO2	✓		✓		✓	✓		
CLO3	✓	✓	✓		✓		✓	✓
CLO4	✓				✓	✓	✓	✓
CLO5		✓	✓			✓	✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBENDE11	Discipline Specific Elective Course	CRITICAL INTERPRETATION OF R.K.NARAYAN	6	4
COURSE OBJECTIVES				
1. To study the cultural, political and social identity. 2. To analyze the culture, races. 3. To evaluate the narrative, socio political changes. 4. To understand the characters, themes in the plays. 5. To illustrate the role of literature.				
Unit-I	Short story collections			18 Hours
Malgudi Days Under the Banyan Tree and Other Stories				
Unit-II	Essays			20 Hours
Next Sunday A Writer's Nightmare				
Unit-III	Autobiography			19 Hours
My Dateless Diary My Days				
Unit-IV	Novel			20 Hours
Swami and Friends The Vendor of Sweets				
UNIT V	Adaptations			18 Hours
The Guide Mr. Sampath				
1. Books for Study/Online Materials: 2. A Critical Study Of The Fictional World Of R.K. Narayan by Amandeep Rana 3. The Fiction of R K Narayan: Appeal in the 21st Century by Subrata Debangana 4. The Novels of R.K. Narayan: A Study of Characters by Dnyate Ramesh 5. Critical Response to R K Narayan by Yadav B. L. 6. The World of Malgudi: A Study of R. K. Narayan's novels by A. Hariprasanna 7. https://instapdf.in/malgudi-days-by-rk-narayan/ 8. https://smartenglishnotes.com/2020/12/21/the-guide-by-r-k-narayan-summary-analysis-characters-theme-and-question-andwers/				
CLO	COURSE LEARNING OUTCOMES: The students will be able to			Knowledge Level
CLO1	Define the culture, language and literature.			K1, K2
CLO2	Interpret ideas associated with cultural, political and social.			K2

CLO3	Analyze the socio-political changes of the characters.	K4
CLO4	Relate to social, historical, cultural and literary contexts.	K4
CLO5	To develop interest in the literature.	K3,K5
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓		✓	✓			✓
CLO2	✓	✓			✓	✓		
CLO3	✓	✓		✓	✓		✓	✓
CLO4	✓				✓	✓		✓
CLO5		✓	✓			✓	✓	✓
NUMBER OF MATCHES= 24 , CORRELATIONS: MODERATE								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBENDE12	Discipline Specific Elective Course	INDIAN ENGLISH POETRY	6	4
COURSE OBJECTIVES 1. To explore on the literary context of Indian English Poetry 2. To illustrate the phases and social and political influences of Indian English Poetry 3. To investigate the themes of Indian English Poetry 4. To introduce haiku and free verse poetry as well as their approaches. 5. To acknowledge the contributions of renowned Indian poets to literature				
Unit-I	POETRY		18 Hours	
Introduction to Indian Poetry in English – Literary renaissance in India – Derozio’s poems- KasiprasadGhose’s <i>The Shair or Minstrel and other Poems</i> – Michael MadhusudanDutt’s <i>The Captive Lady</i>				
Unit-II			18 Hours	
Pre- independence poetry - Post-Independence Poetry Sarojini Naidu- Tagore- AurobindoGhose- HarindranthChattopadhyaya- Nissim Ezekiel- Dom Moraes-JayantaMahapatra				
Unit-III			18 Hours	
Conversion of popular stories from the Ramayana, Mahabharata and the Puranas into English verse by Toru Dutt- Usage of free verse in Indian English Poetry- Lal and D. Narasimhaiah: Two Eliot figures of India- SaleemPeerdina- Agha Shahid Ali- Vikram Seth				
Unit-IV			18 Hours	
Existential Poets-Indian Diasporic Poetry - Haiku in Indian English Poetry; Ethnographic Voices				
UNIT V			18 Hours	
Post-modern Poets - Impressionistic Poets -Voices from the Margin- IndianWomen Poets in India				
Books for Study/Online Materials: 1. https://englishsummary.com/indian-poetry-inenglish/ 2. http://www.tmv.edu.in/pdf/Distance_education/MA(English)/Indian%20Literature%20in%20English/Ch-1.pdf 3. <i>Modern Indian Poetry in English</i> by Bruce King, 1987. 4. <i>The Oxford India Anthology of Twelve Modern Indian Poets</i>, edited by Arvind Krishna Mehrotra, Oxford University Press, 1997 5. <i>A History of Indian Poetry In English</i>, edited by Roshinka Chaudhuri, 2016.				

SEMESTER I

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Define the literary context of Indian English Poetry	K1, K2
CLO2	Trace the socio-political influences in Indian English Poetry	K4
CLO3	Appraise the contribution of Indian poets	K5
CLO4	Try at producing haiku and free verse poetry.	K6
CLO5	Compare women poets from India and other countries	K3
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓		✓		✓	✓
CLO2	✓			✓		✓		✓
CLO3	✓	✓	✓		✓	✓	✓	✓
CLO4	✓	✓	✓				✓	✓
CLO5	✓		✓	✓	✓			

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBENDE13	Discipline Specific Core Course	MODERN ENGLISH LITERATURE	6	4
COURSE OBJECTIVES				
1. To portrait the ideals of the Modern Literature 2. To focus the beauty and imagination of the writers 3. To turn the classical writers as a source of inspiration 4. To analyze the emotional, personal, natural and artistic themes 5. To appreciate the language and literary works form scintillating poets.				
Unit-I	POETRY			12 Hours
T.S. Eliot :Waste Land Ted Hughes : Hawk Roosting W.B. Yeats : Second Coming Philip Larkin : Whitsun Wedding				
Unit-II	PROSE			12 Hours
E.M. Forster : What I Believe T.S. Eliot : Tradition and Individual Talent G.K. Chesterton : A Piece of Chalk C.P. Snow: Two Cultures				
Unit-III	DRAMA			12 Hours
Samuel Beckett : Waiting for Godot Harold Pinter : Birthday Party				
Unit-IV	PROSE			12 Hours
George Orwell :Reflections Of Gandhi Bertrand Russell : a) The Basis of and Ideal Character (From “On Education”) b) How to Escape from Intellectual Rubbish (From “Unpopular Essays)				
Unit-V	FICTION			12 Hours
D.H. Lawrence : Sons and Lovers William Golding :The Spire James Joyce : The Portrait of the Artist as a Young Mans				
Books for Study/ Online Materials:				
1.Heiney, Donald and Downs, Lenthiel H.- Twentieth Century and Critical Theory.Essentials of Contemporary Literature of the Western World – Vol.2				
2. Hudson, Derek – English Critical Essays : Twentieth Century (Second Series -) London: OUP, 1963				
3. James, Pickering H and Jeffery D. Hoeper –Concise Companion to Literature- New York, MacMillan Publishing Co., Inc., 1981.				
4.Selections from the Writing of Bertrand Russell –Emerald Publishers				
5. Joyce James : A Portrait of the Artist As a Young Man. UBS.Publishers Pvt. Ltd.2006.				

Books for Reference/ Online Materials:

1. James, Pickering H and Jeffery D. Hoeper –Concise Companion to Literature- New York, MacMillan Publishing Co., Inc., 1981
2. Selections from the Writing of Bertrand Russell –Emerald Publishers
3. Heiney, Donald and Downs, Lenthil H.- Twentieth Century and Critical Theory.Essentials of Contemporary Literature of the Western World – Vol.2

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Make use of notable Modern Literature.	K1, K2
CLO2	Appreciate the poetic devices and techniques	K4
CLO3	Analyze the poems and prose critically	K5
CLO4	Compare the urbanization of the working classes of the past and present century	K6
CLO5	Organize an ideal social set up inferred from the ideas of the writers.	K3
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓		✓	✓			✓
CLO2			✓		✓	✓		
CLO3	✓	✓		✓			✓	✓
CLO4	✓		✓		✓	✓	✓	
CLO5	✓	✓	✓			✓	✓	✓

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBEN2001	Discipline Specific Core Course	BRITISH LITERATURE-II	5	5

COURSE OBJECTIVES

1. To portrait the ideals of the 19th century
2. To focus the beauty and imagination of the writers
3. To turn the classical writers as a source of inspiration
4. To analyze the emotional, personal, natural and artistic themes
5. To appreciate the language and literary works form scintillating poets.

Unit-I POETRY 12 Hours

William Wordsworth :Tintern Abbey

Samuel Taylor Coleridge :Kubla Khan

Unit-II POETRY 12 Hours

P.B. Shelley : Ozymandias
 Robert Browning : The Last Ride Together
 William Blake :The Lamb/Tiger/London
 Mathew Arnold : Dover Beach

Unit-III PROSE 12 Hours

William Hazlitt :On going a Journey
 Philip Sydney :An Apology for Poetry

Unit-IV DRAMA 12 Hours

Oscar Wilde : Lady Windermere's Fan
 Henrik Ibsen :An Enemy of People

Unit-V NOVEL 12 Hours

Charles Dickens :Great Expectations
 Thomas Hardy : Jude the Obscure

Books for Study/ Online Materials:

1. Lain McCalman An Oxford Companion to the Romantic Age: British Culture, 1776-1832 OUP 2001
2. Nicola Barber The Romantic Poets Evan Brothers Ltd, 2000.
- 3 Great Expectations, Penguin Publishers
4. Jude the Obscure, Penguin Publishers.

Books for Reference/ Online Materials:

1. Rene Wellek History of Modern Criticism, 1750-1950: The Romantic Age v.1& v.2 Jonathan Cape 1966
2. In-House English Literature –The Romantic Age Orient Blackswan 2016.

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Make use of notable 19th century creation of literary work..	K1, K2
CLO2	Appreciate the poetic devices and techniques.	K4
CLO3	Analyze the poems and prose critically.	K5
CLO4	To compare the urbanization of the working classes of the past and present century.	K6
CLO5	To organize an ideal social set up inferring from the ideas from the writers.	K3
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓		✓		✓			✓
CLO2	✓		✓		✓			
CLO3	✓	✓			✓		✓	✓
CLO4	✓				✓	✓	✓	✓
CLO5		✓	✓			✓	✓	✓
Mapping		1-29%		30-59%		60-69%		70-100%
Matches		1-10		11-25		26-30		31-40
Correlation		Poor		Moderate		High		Very High

SEMESTER II

COURSE CODE	COURSE TITLE	HRS/ WEEK	CREDIT
PBEN2002	ENGLISH LANGUAGE AND LINGUISTICS	6	5
COURSE OBJECTIVES			
1. To set an aim to reflect the history of English Language through different periods, an individual's personality through the language development 2. To enable learners to have deeper understanding in studying the language. 3. To teach the 44 sounds of 26 English letters. 4. To reflect the current status of English in India. 5. To analyze wide variety of languages and dialect			
PROGRAMME SPECIFIC OUTCOME			
PSO1 Illustrate the connection between the modern themes and classical and romantic ideas PSO2 Explains the methodical approach to the literature and to categorize. PSO3 Compare the language scientific and non-scientific way of doing things. PSO4 Discovers the visual arts which is vexed and complex history. PSO5 Connects the language as study of reasoning and theory of language. PSO6 Defends why people are complicit with their ideological construction, PSO7 Develops the systematic study of literature and methods to analyze PSO8 Writes effectiveness of rational inquiry, logical and empirical investigations.			
UNIT-I	ENGLISH LANGUAGE	15 Hours	
1. What is Language? 2. Language, behavior and language-systems 3. English in India			
Unit-II	SCIENTIFIC STUDY	15 Hours	
1. What Linguistics is? 2. .Scientific Study of a Language 3. .Linguistics in a historical context 4. .Phonetics and Phonology 5. Organs of Speech 6. Morphological Structure of Words 7. Syntax – Constituent, Argument and Thematic Structures			

8. Semantics and Pragmatics		
Unit-III	CONSONANTS, VOWELS AND SYLLABLES	14 Hours
1. Description and classification of consonants and vowels – allophonic variants 2. Syllable and its structure 3. Intonation, Rhythm and Stress		
Unit-IV	LANGUAGE AND MIND	14 Hours
1. Universal grammar and its relevance 2. Mentalism, rationalism and innateness 3. Language and the brain 4. Language-acquisition		
Unit-V	LANGUAGE AND SOCIETY	14 Hours
1. Sociolinguistics, ethno linguistics and psycholinguistics 2. Accent, dialect and idiolect 3. Standards and vernaculars		
Books for Study: 1. F.T.Wood -“<i>An Outline History of English Language</i>” 2. Frank Palmer -“<i>Grammar</i>” 3. A C Gimson -“<i>An Introduction to the Pronunciation of English</i>” 4. Daniel Jones -“<i>English Pronouncing Dictionary</i>”. 5. George Yule -“<i>The Study of Language</i>”		
Books for Reference: 1. Crystal David -“<i>Linguistics</i>” 2. A C Bough -“<i>A History of English Language</i>” 3. Andrew Radford, Martin Atkinson and David Britain – “<i>Linguistics: An Introduction</i>”, Cambridge University Press 4. Niladri Sekhar Dash – “<i>Applied Linguistics</i>”, Heritage Publication 5. RA Hudson -“<i>Sociolinguistics</i>”, Cambridge University Press 6. Monica Marquez – “<i>Methods in Cognitive Linguistics</i>”, John Benjamins Publishing Company, 2006		

COURSE LEARNING OUTCOMES

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CLOS	On the completion of the programme the student will be able to explain the theoretical concepts and empirical findings of modern linguistics.	KNOWLEDGE LEVEL
CLO1	Identify the language and behavior system in a group.	K1
CLO2	Interprets the oral-auditory arbitrary symbols.	K2
CLO3	Extracts the sound produced by the human speech- organs that have role in the language.	K2
CLO4	Contrasts different language structures.	K4
CLO5	Evaluates the society, its language , beliefs and its practices.	K5

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

COURSE OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)							
CLOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CLO1	✓	✓	✓	✓	✓	✓	✓	✓
CLO2	✓	✓	✓	✓	✓	✓	✓	✓
CLO3	✓	✓	✓	✓	✓	✓	✓	
CLO4	✓	✓	✓	✓	✓	✓	✓	
CLO5	✓	✓	✓	✓	✓	✓	✓	✓
NUMBER OF MATCHES= 38 ,CORRELATIONS: VERYHIGH								

Prepared by: S. KHADER NAWAZ

Verified by: K. NAZER HUSEN

Mapping Correlation Benchmark

MAPPING	1-25%	26-50%	51-74%	75-100%
MATCHES	1-10	11-20	21-30	31-40
CORRELATION	POOR	MODERATE	HIGH	VERY HIGH

SEMESTER-II

COURSE CODE	CATEGORY	COURSE TITLE	Hours	Credits
PBEN2003	Discipline Specific Core Course	NEW LITERATURE IN ENGLISH	6	4
COURSE OBJECTIVES				
1. To provide a critical introduction to contemporary English literatures 2. To familiarise students with the literature of Africa, the Caribbean, Canada, and Australia. 3. To familiarize students with the perspectives of millennials. 4. To cultivate a love of reading and an interest in literary works.				
Unit-I	POETRY (NON- DETAILED)			18 Hours
Vikram Seth :The Frog and the Nightingale Wole Soyinka :Telephone Conversation A.D. Hope :Australia Judith Wright :Fire at the Murdering Hut David Diop : Africa				
Unit-II	POETRY (Detailed)			18 Hours
Derek Walcot : The Sea is History (Detailed) Margaret Atwood :Journey to the Interior (Detailed) Dom Moraes :Letter to My Mother (Detailed) F.R. Scott : The Canadian Authors Meet				
Unit-III	PROSE			18 Hours
Chinua Achehe :Marriage is a Private Affair Stuart Hall :Cultural Identity and Diaspora				
Unit-IV	DRAMA			18 Hours
Wole Soyinka : The Lion and the Jewel Sharon Pollock : Blood Relations				
Unit-V	FICTION			18 Hours
Margaret Laurence :The Stone Angel (1964) James Ngugi : A Grain of Wheat				
Books for Study:				
1. OyekanOwomoyela. A History of Twentieth-Century African Literatures. University of Nebraska Press, 1993.				
2. Birney, Irele, Abiola. F.The African Imagination: Literature in Africa and the Black Diaspora.				

Oxford University Press, 2001.

3. Andrew Taylor. Reading Australian Poetry. Queensland: U of Queensland P 1987.

4. Malcolm Ross. "Introduction". Poets of the Confederation. Toronto: McLelland and Stewart, 1960.

5. John W. Garvin. ed. "Archibald Lampman". Canadian Poets and Poetry. Toronto, Ontario: McClelland, Goodchild & Stewart. 1916.

Books for Reference:

1. David I. Ker. The African Novel and the Modernist Tradition. Peter Lang Publishing, 1998.

2. Parekh, Pushpa Naidu and Siga Fatima Jagne. Postcolonial African Writers: A Bio-Bibliographical Critical Sourcebook. Greenwood Press, 1998.

3. Gary Geddes. ed. Fifteen Canadian Poets. Toronto: Oxford University Press, 2001.

CLO	COURSE LEARNING OUTCOMES: The students will be able to	Knowledge Level
CLO1	Define the facets of contemporary literature	K1, K2
CLO2	Compare the works of New literatures	K4
CLO3	Criticize a text in the context of neocolonialism, nation-gendering, feminism and diaspora.	K5
CLO4	Relate the works of contemporary literature to the past.	K3
CLO5	Determine the relevance of prior literary knowledge to the present.	K6
	K1-Remembering/knowledge, K2-Understand, K3-Apply, K4-Analyse, K5-Evaluate, K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓	✓	✓		✓		✓	✓
CLO2	✓		✓	✓	✓			
CLO3	✓	✓	✓		✓		✓	✓
CLO4	✓		✓		✓	✓		
CLO5	✓		✓	✓	✓			

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II

COURSE CODE	CATEGORY	COURSE TITLE	HOURS	CREDITS
PBEN2004	Discipline Specific Core Course	POSTCOLONIAL LITERATURE	5	4
COURSE OBJECTIVES				
6. 1. To highlight the cultural, political and social identity. 7. To build interest in nationhood and nationalism. 8. To analyze the history, culture and races. 9. To examine the contextual reflections carefully. 10. To understand the emotions of postcolonial writers.				
Unit-I	POETRY			15 Hours
A.D. Hope : Australia Kofi Awoonor : The Weaver Bird Terek Walcott : A Far Cry From Africa				
Unit-II	PROSE			15 Hours
Ngugi Wa Thiong’o : Decolonizing The Mind(Chapter-1- The language of African Literature) Frantz Fanon : Black Skin White Mask(Chapter-1-The Negro and Language)				
Unit-III	DRAMA			15 Hours
George Ryga: The Ecstasy of Rita Joe Wolesoyinka: Kongi Harvest				
Unit-IV	NOVEL			15 Hours
*Chinua Achebe: Things Fall Apart *Jamaica Kincaid: A Small Place				
UNIT V	FEMINISM AND CRITICAL THEORY			15 Hours
*Urvashi Butalia : The Other Side of Silence Chakravorty Spivak: Three Women’s Text and a Critique of Imperialism Gayatri Helen Tiffin Griffiths, Ashcroft: The Empire Writes Back(Introduction, Cutting the Ground)				
Books for Study/Online Materials: 1. B. Ashcroft: The Empire Writes Back. 2. Edward Said: Orientalism. 3. Homi Bhabha: Nation and Narration 4. Aijaz Ahmad: In Theory. 5. Makarand Paranjape(ed.): In-diaspora.				
CLO	COURSE LEARNING OUTCOMES: The students will be able to			Knowledge Level

CLO1	Knowing key ideas and texts and intellectual shifts in reading the culture, language and literature.	K1
CLO2	Infer with ideas and concepts of 20th century criticism.	K2
CLO3	Analyze ideas associated with movements like structuralism, post structuralism and feminism.	K4
CLO4	Evaluate with changing notions of the relationship between humans and nature	K5
CLO5	Recurrence in later social, historical, cultural and literary contexts.	K6
	K1-Remembering/knowledge,K2-Understand,K3-Apply,K4-Analyse,K5-Evaluate,K6-Create	

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO1	✓			✓	✓			✓
CLO2	✓	✓			✓	✓		
CLO3	✓	✓		✓	✓		✓	✓
CLO4	✓	✓			✓	✓		✓
CLO5		✓	✓			✓	✓	✓
NUMBER OF MATCHES= 24 ,CORRELATIONS: MODERATE								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

COURSE CODE	COURSE TITLE	HRS/ WEEK	CREDIT
PBENDE21	NEW TRENDS OF CONTEMPORARY LITERATURE	6	4
COURSE OBJECTIVES			
1. To explain the political and social and personal disillusionment.			
2. To interpret contemporary literature in new cynicism.			
3. To teach the idea handed down from the early 20 th century.			
4. To process the documents fragmentation into a cohesive whole.			
5. To rewrite the thinking and learning styles with logic.			
PROGRAMME SPECIFIC OUTCOME			
PSO1	Illustrate the connection between the modern themes and classical and romantic ideas		
PSO2	Explains the methodical approach to the literature and to categorize.		
PSO3	Compare the language scientific and non-scientific way of doing things.		
PSO4	Discovers the visual arts which is vexed and complex history.		
PSO5	Connects the language as study of reasoning and theory of language.		
PSO6	Defends why people are complicit with their ideological construction,		
PSO7	Develops the systematic study of literature and methods to analyze		
PSO8	Writes effectiveness of rational inquiry, logical and empirical investigations.		
UNIT-I	INTRODUCTION	15 Hours	
Early 20 th Century Poets			
Early Modern Writers			
Emerging Literature Trends and Technologies			
Canon and Literary Tradition			
Unit-II	THEORETICAL APPROACHES IN LITERATURE	15 Hours	
Formalism			
Feminist Criticism Archetypal Criticism			
Psychoanalytic Criticism			
Deconstruction			
Struturalism			
Theoretical Approaches to Literature			
Unit-III	LITERATURE IN 20 TH AND 21 ST CENTURY	14 Hours	
Literature in 20 th Century			
Literature in 21 st Century			
Literary Movements of the 20 th and 21 st Cetury			
Unit-IV	MARXISM THEORY	14 Hours	
Development Of Marxist Criticism			
Marxism And Critical Theory			
Marxist Culture Theory			
Unit-V	LITERARY THEORY AND LITERATURE	14 Hours	

1. The Social and Political Thought of Karl Marx-Shlomo Avineri(1968) Cambridge University Press.
2. Class and Class Conflict in Industrial Society-Ralf Dahrendorf(1959)Stanford University Press.
3. Literary Theory: An Introduction-Terry Eagleton
4. <https://www.sampleassignment.com/blog/what-are-the-trends-in-contemporary-literature>
5. <https://www.ukessays.com/essays/english-language/exploring-new-trends-of-literature-english-language-essay.php>

7. Marxism After Marx-David McLellan-Basingstoke:Palgrave Macmillan
8. Marxism:An Autopsy:Boston:Houghton Mifflin-Henry Bamford Parkes
9. From Formalism to Poststructuralism-Richard Rorty- Cambridge: Cambridge UP,1995
10. <https://study.com/academy/lesson/what-is-contemporary-literature-definition-writing-style.html>
11. <https://www.jstor.org/stable/27530554?seq=1>

		KNOWLEDGE LEVEL
	On the completion of the programme the student will be able to interpret the ideas and the combination of the ideas that are imitated.	
CLO1	Tells how to rely on our perspective in the society of constant changes	K1
CLO2	Uses scientific methods to study the literary and poetic language	K3
CLO3	Contrast the moral superiority of life in the city and the countryside.	K2,k4
CLO4	Criticizes literary based on the socialist and dialectic theories	K5
CLO5	Invents the systematic study of the literary theory	K6

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

COURSE OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)							
CLOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CLO1	✓	✓	✓	✓	✓	✓		✓
CLO2	✓	✓	✓	✓	✓	✓	✓	
CLO3	✓	✓	✓	✓	✓	✓	✓	✓
CLO4	✓	✓	✓	✓	✓	✓	✓	
CLO5	✓	✓	✓	✓	✓		✓	✓
NUMBER OF MATCHES= 36 ,CORRELATIONS: VERY HIGH								

Prepared by: KHADER NAWAZ

Verified by:K. NAZER HUSEN

Mapping Correlation Benchmark

MAPPING	1-25%	26-50%	51-74%	75-100%
MATCHES	1-10	11-20	21-30	31-40
CORRELATION	POOR	MODERATE	HIGH	VERY HIGH

SEMESTER II

COURSE CODE	COURSE TITLE	HRS/WEEK	CREDIT
PBENDE22	POSTMODERNISM	6	4
COURSE OBJECTIVES			
1.To Explain the diversity of human experiences. 2.To Discover the significant political and social occasions. 3.To Teach development of individual and social identity and self creation 4.To Judge the popular and elite forms of culture. 5.To Write the history of postmodernism.			
PROGRAMME SPECIFIC OUTCOME			
PSO1	Illustrate the connection between the modern themes and classical and romantic id		
PSO2	Explains the methodical approach to the literature and to categorize.		
PSO3	Compare the language scientific and non-scientific way of doing things.		
PSO4	Discovers the visual arts which is vexed and complex history.		
PSO5	Connects the language as study of reasoning and theory of language.		
PSO6	Defends why people are complicit with their ideological construction,		
PSO7	Develops the systematic study of literature and methods to analyze		
PSO8	Writes effectiveness of rational inquiry, logical and empirical investigations.		
UNIT-I	INTRODUCTION	15 Hours	
What is postmodernism? PHILOSOPHY,CULTURAL THEORY AND THEOLOGY ADVERSARIES OF POSTMODERNISM POSTMODERNISM AND FEMINISM POSTCOLONIALISM AND POSTMODERNISM			
Unit-II	POSTMODERNISM AND THE LITERARY ARTS	15 Hours	
POSTMODERN FICTION POSTMODERN POETRY POSTMODERN THEATRE AND PERFORMANCE			
Unit-III	POSTMODERNISM IN VISUAL ART,SCULPTURE AND THE DESIGN ARTS	14 Hours	
VISUAL ART POSTMODERNISM LAND ART KEY CHARACTERISTICS OF SULPTURE , PLASTIC AND PERFORMANCE ART KEY CHARACTERISTICS OF CREATIVE DESIGN			

Unit-IV	POSTMODERNISM,POPULAR CULTURE AND MUSIC	14 Hours
KEY CHARACTERISTICS OF POSTMODERN POP MUSIC		
Unit-V	POSTMODERNISM AND THE SOCIAL SCIENCES	14 Hours
POSTIVISM AND THE SOCIAL SCIENCES INTERNATIONAL RELATIONS THEORY		
Books for Study: 1. Beginning Postmodernism-Second Edition-2010-Tim Woods 2. Postmodernism for Beginners-Cambridge, Icon Books,1995-Appignanesi, Richard and Chris Garrat. 3. The Cambridge Companion to Postmodernism-Sтивен Connor-Cambridge, Cambridge University Press,2004 4. The Illusions of Postmodernism-Terry Eagleton-Oxford, Blackwell,1996 5. Special Issues on Postmodernism, Theory, Culture, Society-Mike Featherstone-5(June 1988)		
Books for Reference: 1. Postmodernity-David Lyon-Buckingham, Open University Press,2001 2. The postmodern-Simon Malpas-London,Routledge, 2005 3. Modernity and Postmodern Culture-Jim McGuigan-Buckingham:Open University Press, 2006 4. https://plato.stanford.edu/entries/postmodernism/ 5. https://www.preservearticles.com/essays-in-english-language/1125-words-free-sample-essay-on-post-modernism/6251		

COURSE LEARNING OUTCOMES:

CLOS	On the completion of the programme the student will be able to recognizes transformation of social changes.	KNOWLEDGE LEVEL
CLO1	Describe the uneven development across the human and social sciences	K1
CLO2	Classifies the well being of the society	K2
CLO3	Interprets postmodernism as science and scientific method	K2
CLO4	Connects new learning ships and knowledge creation potential	K4
CLO5	Develops a clear, stable and sustaining image of self.	K6

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

COURSE OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)							
CLOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CLO1	✓	✓	✓	✓	✓	✓	✓	✓
CLO2	✓	✓	✓	✓	✓	✓	✓	✓
CLO3	✓	✓	✓	✓		✓	✓	✓
CLO4	✓	✓		✓	✓	✓	✓	✓
CLO5	✓	✓	✓	✓	✓	✓	✓	✓
NUMBER OF MATCHES= 38 ,CORRELATIONS: VERY HIGH								

Prepared by: S. KHADER NAWAZ

Verified by: K NAZER HUSEN

Mapping Correlation Benchmark

MAPPING	1-25%	26-50%	51-74%	75-100%
MATCHES	1-10	11-20	21-30	31-40
CORRELATION	POOR	MODERATE	HIGH	VERY HIGH

SEMESTER II

COURSE CODE	COURSE TITLE	HRS/WEEK	CREDIT
PBENDE23	CRITICAL INTERPRETATION OF ENGLISH POETRY	6	4
COURSE OBJECTIVES			
1. To introduce the adaptation of themes-models verse forms of traditions and classical literature. 2. To paraphrase the certain kind of attitude to land and peasants with respect to their region. 3. To transfer the perspective of handling of nature from rural to urban, as nature as it is. 4. To contrast the political changes and social changes in terms of industrialization development. 5. To develop socially- aware criticism associated with the technical innovations in writing.			
PROGRAMME SPECIFIC OUTCOME			
PSO1	Illustrate the connection between the modern themes and classical and romantic ideas		
PSO2	Explains the methodical approach to the literature and to categorize.		
PSO3	Compare the language scientific and non-scientific way of doing things.		
PSO4	Discovers the visual arts which is vexed and complex history.		
PSO5	Connects the language as study of reasoning and theory of language.		
PSO6	Defends why people are complicit with their ideological construction,		
PSO7	Develops the systematic study of literature and methods to analyze		

PSO8 Writes effectiveness of rational inquiry, logical and empirical investigations.		
UNIT-I	INTRODUCTION	15 Hours
ELIZABETH SONG METAPHYSICAL POETS THE ROMANTIC MOVEMENTS COMIC VERSE		
Unit-II	THE SIXTEENTH CENTURY	15 Hours
WILLIAM SHAKESPEARE EDMUND SPENCER THOMAS WYATT		
Unit-III	THE SEVENTEENTH CENTURY	14 Hours
JOHN DRYDEN EDMUND WALLER BEN JONSON		
Unit-IV	THE EIGHTEENTH CENTURY	14 Hours
OLIVER GOLDSMITH THOMAS GRAY ALEXANDER POPE		
Unit-V	THE NINETEENTH CENTURY	14 Hours
ALFRED TENNYSON WILLIAM WORDSWORTH ST COLERIDGE		
Books for Study: 6. Critical Interpretation of T.S. Elliot-Anupama Roy 7. Critical Interpretation of W.B. Yeats-Richa Dewani 8. Critical Interpretation of Geoffrey Chaucer- A. Prakash&R. Dewani 9. Critical Interpretation of P.B. Shelley- Aditya Sabharwal 10. https://courses.lumenlearning.com/suny-britlit1/chapter/literary-criticism/		
Books for Reference: 12. Critical Interpretation of D.H. Lawrence-Anand Prakash 13. Critical Interpretation of English Fiction- Anand Prakash 14. https://libguides.brooklyn.cuny.edu/c.php?g=436098&p=3815452 15. https://www.masterclass.com/articles/how-to-analyze-poetry#quiz-0 16. https://mgccc.edu/learning_lab/writing/poetry/poetry.html		

COURSE LEARNING OUTCOMES:

CLOS	On the completion of the programme the student will be able to explain the theoretical concepts and empirical findings of modern linguistics.	KNOWLEDGE LEVEL
CLO1	Defines the critical introduction which stimulate the researches to analyze the work independently	K1
CLO2	Transfers the literary appreciation to literary enlightenment	K3
CLO3	Connects the ideas and attitudes with the new learning to an universal society	K4
CLO4	Criticizing the views morally, culturally and intellectually	K5
CLO5	Writes for nonviolence in protest and political action to vast audience	K6

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

MAPPING WITH COURSE LEARNING OUTCOME (CLOs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

COURSE OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)							
COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	
NUMBER OF MATCHES= 37 ,CORRELATIONS: VERY HIGH								

Prepared by: S. KHADER NAWAZ

Verified by: K. NAZER HUSEN

Mapping Correlation Benchmark

MAPPING	1-25%	26-50%	51-74%	75-100%
MATCHES	1-10	11-20	21-30	31-40
CORRELATION	POOR	MODERATE	HIGH	VERY HIGH

CERTIFICATE COURSE IN SPOKEN ENGLISH

ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI

I. PHONOLOGY OF ENGLISH

OBJECTIVES:

- 1) To identify the sound patterns of the English language.
- 2) To understand the sound that is not in their regional language.
- 3) To recognize the word stress and speech rhythm in Spoken English.
- 4) To extend the use of vocabulary
- 5) To enhance fluency and comprehension of the language

Topics:

Phonemes: 12 Pure Vowels, 8 Diphthongs and 24 Consonants

Syllables: Kinds of syllables

Word Stress: Primary Stress, Secondary Stress, Penultimate stress and Anti-penultimate stress.

Tones : Rising Tone and Falling Tone

- Practical Test:**
- 1 A passage from the text will be given to read aloud, to check the pronunciations of the words.
 2. Work Sheets will be given to mark the word Stress and the Tones

- Reference Books:**
- 1) Elements of Linguistics and Phonetics-Dr. Amresh Sharma
 - 2) English Phonology-An Introduction-Heinz J. Giegerich- Cambridge University Press

(BOOKS AVAILABLE AT COLLEGE LIBRARY)

II. CONVERSATION IN ENGLISH

OBJECTIVES:

- 1) To train the student to speak slowly and clearly the routine and familiar topics.
- 2) To improve students with day-to-day English conversation.
Describing family, other people and living conditions.
- 3) To discard inhibitions and develop competence level in them.
- 4) To enhance fluency and comprehension of the language
- 5) To extend the use of vocabulary

Topics:

Greeting and introducing

Buying and asking prices

Invitations

Describing People

Frequency and Time Duration

Requesting/Offering Asking permission-Giving permission

Practical Test: 1. Students will be given a situation and were asked to do a role-play.
2. Students to listen to the conversation and have mark their responses in the worksheet.

Reference Books: 1) Speaking English Effectively -Krishna Mohan & N.P. Singh – Macmillan
2) English Conversation Practice- Grant Taylor- Tata McGraw-Hill Publishing Company Ltd.
3) Innovative Technique of Communication –Vipul V. Mahodia- Paradise Publisher-Jaipur

(BOOKS AVAILABLE AT COLLEGE LIBRARY)

Topics:

III. BASIC ENGLISH GRAMMAR

OBJECTIVES:

1. To introduce temporal linguistics quality.
2. To use appropriate tense for appropriate occasion.
3. To express thoughts and feelings meticulously.
4. To enhance fluency and comprehension of the language
5. Perfect usage of grammar in the right context

Topics:

1. Parts of Speech and their usage
2. Articles, prepositions, conjunctions/ linkers, adverbs of frequency, can/could for request, used to +verb, Modals verbs, question tags, active and passive, direct and indirect speech
3. Tenses and their uses.

Practical Test: Audio will be played; students have to mark their responses in the worksheet-Cloze Test.

Reference Books: 1) Tenses- Keshab Pradhan-Pacific Books International
2) English Grammar and Comprehension- J.K. Chopra- Unique Publisher

FIVE WEEK ONLINE CERTIFICATE COURSE IN ENGLISH FOR BUDDING ENTREPRENEUR

PART 1- Course Learning Outcomes

1. Students will be able to identify the word related to business wealth.
2. Students can compare the way of business expression of past to the present market-changing scenario.
3. Students can use the idiomatic phrases that meant of business transaction.
4. Students can value the existing data through which it is communicated.
5. Students can write the business proposal with the suitable vocabulary.

PART-2

GUIDELINES

EVERYONE SHOULD PARTICIPATE

PRESENTING GOOD IDEAS ARE ALWAYS APPRECIATED

POSTING PICTURES CAN BE AVOIDED-

EMOTICONS ARE NOT MUCH APPRECIATED

LET'S BE POLITE WITH OUR WORDS AND SENTENCES

PART-3

WEEK-1

TOPIC: INTRODUCTION- **About this Program**-(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **Much to be learned from the Industry Authorities**

VIDEO- READ BY THE TEACHER

GRAMMAR-FROM THE ARTICLE

ASSIGNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-2

TOPIC - **BUDDING ENTREPRENEUR** -(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **PEARLS OF WISDOM**

<https://corporatecitizen.in/v7-Issue1/pearls-of-wisdom-building-beautiful-relationships.html>

VIDEO- READ BY THE TEACHER

GRAMMAR-FROM THE ARTICLE

ASSIGNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-3

TOPIC - **BUDDING PSYCHOLOGY** -(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **WORK-LIFE BALANCE**

<https://corporatecitizen.in/v7-Issue3/work-life-balance-secret-is-to-use-the-right-strategy.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-4

TOPIC – **BUSINESS AND TECHNOLOGY** -(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **TRULY, MENTORING IS AN ART**

<https://corporatecitizen.in/v7-Issue5/the-last-word-truly-mentoring-is-an-art.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-5,

TOPIC – **LISTENING TO THE CUSTOMERS**-(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **FIRST THOUGHT**

<https://corporatecitizen.in/v7-Issue8/first-thought-rhythms-of-leadership.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

Department of History
UG & PG Syllabi

Programme Outcomes (POs) of the UG Programme**After the completion of B.A. History programme, the students will be able to**

- PO 1 Communicate in English, ideas, thoughts & knowledge effectively in conversations, and meetings & especially in a Digital environment. Develop linguistic skills in one Indian/Regional language
- PO 2 Demonstrate domain-specific knowledge and its applications in real-life situations
- PO 3 Synthesize learned knowledge and skills to effectively and efficiently perform the job duties of a profession
- PO 4 Critically evaluate a situation and suggest a solution after careful consideration of the alternatives
- PO 5 Exhibit potential to accomplish tasks independently or as a member or leader of a team
- PO 6 Plan and Execute a Project after careful evaluation of the activities involved
- PO 7 Develop products, Design Policies, and/or collaborate to help Society in building a Sustainable Environment
- PO 8 Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT
- PO 9 Demonstrate ability towards critical thinking about his role as a responsible citizen
- PO 10 Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

Programme Specific Outcomes (PSOs) of the UG Programme in History**After the completion of B.A. History programme, the students will be able to**

- PSO 1 Explain the evolution, growth and progress of human Civilization in different parts of the world and India, acquire the attributes and values required for the development of our World and our Nation.
- PSO 2 Discover skills required for career building through competitive examinations, develop skills required to be employed in other allied disciplines and pursue higher education in Historical Studies and Allied Disciplines
- PSO 3 Recognize the manifold factors influencing the development of an administrative structure and national policies that impact the society, economy and culture and develop the qualities to become good administrators.
- PSO 4 Use the leadership qualities acquired like decision - making ability, knowledge of allied disciplines, developing self-learning skills and art of communication to express their view points.
- PSO 5 Recognize the varied historical narratives from various of sources and critically interpret narratives with the capacity to effectively communicate individual opinion.
- PSO 6 Interpret the implication of the past on the present and acknowledge its relevance in the future development.
- PSO 7 Identify and effectively communicate the problems in the relevant field of study and apply the acquired knowledge to work for better solutions.
- PSO 8 Develop the passion to be a lifelong learner with the ability to construct a self-developed Bibliography on any area of interest and utilize e-resources and libraries to acquire the knowledge.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓		✓		✓	✓	✓	✓
PSO2	✓	✓	✓			✓		✓		
PSO3		✓	✓	✓	✓		✓		✓	✓
PSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO6		✓	✓	✓	✓	✓	✓		✓	✓
PSO7		✓	✓	✓	✓	✓	✓		✓	✓
PSO8	✓	✓	✓		✓	✓		✓		
Number of Matches = 62 Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SEMESTER - I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBHI1001	Discipline Specific Core Course	HISTORY OF INDIA UP TO CE 712	7	6
Course Objectives				
1. Trace the History of the development of civilization in Ancient India 2. To Study the life of people during Indus Valley and Vedic Period 3. Explain the emergence of state and rise of new religious movements 4. Study the culture of Mauryan Period and Gupta Empire				
Unit-I	Introduction: Geographical features and Influence on Indian History - Sources of Indian History - Pre-history: Palaeolithic - Mesolithic - Neolithic Cultures - Distribution - Tools - Patterns of Exchange			21 Hours
Unit-II	Indus Valley Civilization and Vedic Period: Indus Valley Civilization - Origin - Extent - Major Sites - Town Planning - Seals - Religion - Society - Internal and External trade - Decline - Vedic Period - origin -Rig Vedic and Later Vedic Period - Society and Culture -Vedic Literature - Polity - Economy - Religion			21 Hours
Unit-III	Emergence of State andRise of new Religious Movements - Janapadha - Sixteen Mahajanapadhas - Ajivikas - Charwakas - Lokayathas - Jainism - Tri Ratna - Five Great Vows - Buddhism - Four Noble Truths - Eight-Fold Path - Buddhist Councils - Rise of Magadha - Nandas - Persian and Alexander’s invasion and its effects			21 Hours
Unit-IV	Mauryan Empire: Establishment - Asoka and his Dhamma - Asokan Edicts - Polity - Administration - Society - Economy - Religion - Literature - Art and Architecture - Causes for its decline - Post Mauryan Kingdoms: Indo-Greeks - Sungas - Sakas - Satavahanas - Kushanas - Parthians - Post Mauryan: Society - Economy - Religion - Literature - Art and Architecture			21 Hours
Unit-V	Gupta Empire: Political History - Administration - Polity - Society - Economic Conditions - Agriculture - Land grants - Feudalism - Caste system - Position of women - Education - Religion - Literature - Science and technology - Art and Architecture- Fahien - Harshavardana and his Achievements - Hiuen TsangArab invasion of Sind and its impact			21 Hours
Books for Study:				
1. Mahajan V. D., Ancient India, S. Chand & Co, New Delhi, 2018.				

2. Sharma L. P., *Ancient History of India*, Vikas publishers, New Delhi, 2008.
3. Majumdar R. C., Raychaudri H. C. & Dutta K., *An Advanced History of India*, Macmillan, Chennai, 2004.

Books for Reference:

1. Kosambi, D. D., *The Culture and Civilization*, Standard Book Distribution House, New Delhi, 2001.
2. Metcalf D and Thomas, R. Metcalf, *A Concise History of India*, Cambridge University Press, 2002.
3. Romila Thapar, *A History of India, Vol-I*, Penguin books, New Delhi, 1990.
4. Upinder Singh, *A History of Ancient and Early Medieval India*, Pearson and Longman, 2008.

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to	Knowledge Level
CLO1	Elucidate the culture of Pre-history.	K1
CLO2	Comprehend the Indus valley and Vedic Culture.	K2
CLO3	Infer the emergence of the state and Sixteen Mahajanapadhas	K2
CLO4	Compare the differences between Jainism and Buddhism.	K2
CLO5	Teach the developments of Mauryan and Gupta period.	K3

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓			✓	✓		✓
CLO 2	✓	✓	✓	✓	✓	✓	✓	✓
CLO 3	✓	✓	✓	✓	✓	✓	✓	✓
CLO 4	✓	✓		✓	✓	✓		✓
CLO 5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches = 35 Correlations: Very High								

Prepared by: Mr. MD Ghufan R

Verified by: Mr. D. Abul Fazal

SEMESTER - I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
UBHIAL11	Other Elective Course	INTRODUCTION TO TOURISM	7	5
Course Objectives				
1. To impart the knowledge on basic concepts about Tourism 2. To create awareness about the various types and forms of Tourism 3. To create awareness about Tourism enabled Services and Industries 4. To analyse the role of Various Organisations in the promotion of Tourism				
Unit-I	Introduction: Definition, Nature, Scope and Importance of Tourism - Tourism and Economy - Basic Components of Tourism - Motivations for Tourism - Factors Affecting Tourism - Negative impact of Tourism.		21 Hours	
Unit-II	Types of Tourism: Kinds of Tourism: Domestic - International - Space - Virtual - Forms of Tourism: Historical Tourism - Cultural Tourism - Educational Tourism - Religious and Spiritual Tourism - Medical and Health Tourism - Adventure Tourism - Dark Tourism - Eco-Tourism		21 Hours	
Unit-III	Tourism Amenities: Transport: Rail - Road - Water - Air - Accommodation: Types of Accommodation - Supplementary Accommodation Accommodation in India: Dharmasalas, Chaultries, Sarais and Musafirkanas.		21 Hours	
Unit-IV	Tourism Organisations: World Tourism Organisation (WTO) - International Air Transport Association (IATA) - International Civil Aviation Organisation (ICAO) - Pacific Area Travel Association (PATA) -Travel Agents Association of India (TAAI)		21 Hours	
Unit-V	Role of Government in Promoting Tourism in India: Sargent Committee - Ministry of Tourism - India Tourism Development Corporation (ITDC) - Tamil Nadu Tourism Development Corporation (TTDC) - National Tourism Action Plan 1992 - Recent Govt. Policies		21 Hours	
Books for Study				
1. Charles R. Goeldner, Bernard Cohen: <i>Tourism Principles, Practices, Philosophies</i> , Wiley Students Edition, Wiley India, New Delhi, 1984. 2. Dr. C. Selvaraj, <i>Principles of Tourism</i> , CSR Publication, Kanyakumari District, 2017. 3. Dr. R. Santha Kumari, <i>Tourism</i> , Santha Publishers, Chennai, 2018.				
Books for Reference				
1. Bhatia, A.K: <i>Tourism Development: Principals and Practices</i> , Sterling Publishers Pvt, Ltd, New Delhi, 1989. 2. Burkart A.J. and Madlik: <i>Tourism, Past, Present and Future</i> , Heinemann, London, 1994. 3. Ashu Pasricha: <i>International Tourism</i> , Concept Publications, New Delhi, 2009.				

4. Suddhendu Raju Mishra and Sapan Kumar Sadual: *Basics of Tourism Management*, Excel Books, New Delhi, 2009.

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO 1	Recognise the fundamentals of tourism.	K1
CLO 2	Articulate various forms of tourism.	K3
CLO 3	Summarise the role of various national and international organisations in the promotion of tourism.	K2
CLO 4	Explain various plans and programmes of Government to promote tourism.	K1
CLO 5	Summarise the basic concepts of tourism	K2

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓			✓	✓
CLO 2	✓	✓	✓	✓			✓	✓
CLO 3	✓	✓	✓	✓			✓	✓
CLO 4	✓	✓	✓	✓			✓	✓
CLO 5	✓	✓	✓	✓			✓	✓
Number of Matches = 30 Correlations: High								

Prepared by: Mr. P. Basith Assarani
Fazal

Verified by: Mr. D. Abul

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBVBC102	Value-Based Course	Physical Education – Yoga	1	1
Course Objectives				
Unit-I	Yoga the Education			3 Hours
Aim and objective- The evolution of the human system according to yoga. History and fundamentalsof				

Yoga and Naturopathy. Yoga for personality developments.		
Unit-II	Yogasutra	3 Hours
Classification of yoga, method to control of chitta vrittis. Samprajnata Samadhi, asamprajnata, Iswarapranidhana. Chittavikshepa, chittaprasadana, control of chitta-vikshepa, manasthiti, samapatti, Suksmavyayama, sabijasamadhi, speciality of nirvichara, ritambharaprajna, nirbijasamadhi, kriya-yoga and its benefits.		
Unit-III	Yoga for Health	3 Hours
Methods to control the Kleshas, Karmashaya, Vipaka of kleshamula, Heyaswarupa, Heyahetu, Drshya and Drasta, Samyoga, Hanopaya, Hanaswarupa, Vivekakhyathi, Astanga yoga-Vama, Niyama, Asana, Pranayama, Ratyahara-Bahiranga Yoga, Dharana, Dhyana, Samadhi-Antaranga Yoga.		
Unit-IV	Yoga for common ailments	3 Hours
Yoga for respiratory system - nasal allergy and asthma, cardiovascular System - hypertension and for artery diseases, digestive system - hyperacidity, irritable bowel syndrome, reproductive system - infertility, menstrual disorders, endocrine System - diabetes, obesity, thyroid, nervous System, migraine, Psychiatry - Anxiety, depressive neurosis, stress, Insomnia, Musculo Skeletal System - Arthritis, back pain - Yoga for eyes.		
Unit-V	Practical Only	3 Hours
1. Surya Namaskara 2. Kapalbhati 3. Bharadvaja's twist 4. Sirasana 5. Halasana 6. Iyengar yoga 7. Gomukasana 8. Bhujangasana 9. Utkatasana 10. Janu sirasana		
Books for Study 1. Anatomy and Physiology of Yogic Practices - M.M Ghore, Kaivalyadhama, Lonavala, Pune. 2. A Systematic course in the ancient tantric techniques of yoga and kriya - Bihar School of Yoga, Munger. 3. Yoga for different ailments - series published by SVYASA, Bangalore and Bihar Yoga Bharati. 4. Yoga therapy : by Swami Kuvalayanand, Kaivalaya dhama, Lonavala. 5. Yogic therapy : Swami Shivananda, Umachal Yoga Ashram, Kamakhya, Assam. 6. Light on Pranayama - B.K.S. Iyengar 7. Asana, Pranayama, Mudra, Bandha - Swami Satyananda Saraswati, Bihar School of Yoga, Munger. Pranayama - published by SVYASA, Bangalore		
Books for Reference: 1. Yoga for common ailments : Robin Monro, Nagarathna & Nagendra - Guia Publication, U.K. 2. The Principles and Practice of medicine Davidson 3. The Yamas & Niyamas: Exploring Yoga's Ethical Practice by Deborah Adele. 4. Bringing Yoga to Life: The Everyday Practice of Enlightened Living by Donna Farhi		
Course Learning Outcomes (CLOs)		

The student is able to

- (i) To learn Basic concepts about different types of Yoga and classification of yoga
- (ii) Promote positive health, prevent stress and rejuvenate himself through Yoga.
- (iii) Withstand common ailments and avoid unnecessary intake of medicine
- (iv) The Students will learn the Yogasanas for health and for the personality development

SEMESTER - I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBVBC101	Value-Based Course	MORAL EDUCATION	1	1
Course Objectives				
1. To study the need and objectives of Moral Education.				
2. To inculcate the spirit of respecting ethos of all religion in order to lead a peaceful life.				
3. To learn the individual traits and qualities needed for a dignified life.				
4. To bring the family values among the younger generation and to establish a cultured, honoured and dignified society.				
Unit-I	Moral Education: Introduction - Definition - Need and Objective of Moral Education			3 Hours
Unit-II	Peace and Harmony: Mutual Respect for different Cultures, Religion and their beliefs - Tolerance - Secularism - Fraternity			3 Hours
Unit-III	Individual Values: Truthfulness - Honesty - Courage - Self-Respect - Self-Confidence - Selflessness - Leadership Qualities			3 Hours
Unit-IV	Family Values: Importance and need of the Family - Respect and services to the parents - Establishing relationship with the siblings and relatives			3 Hours
Unit-V	Social Values: Charity - Equality - Gender Equality - Hospitality - Justice - Reverence to the Elders - Affection to Children - National Pledge			3 Hours
Books for Study				
1. R. K. Lakshmi Narayanan and M. Uma Maheshwari, <i>Value Education</i> , Garuda Learning, Chennai, 2009.				
2. S. Ignacimuthu, <i>Values for Life</i> , Better Yourself Books, Mumbai, 1991.				
3. Daniel and Selvamony, <i>Value Education Today</i> , Madras Christian College, Tambaram and ALACHE, New Delhi, 1990.				
Books for Reference				
1. S. P. Sharma, <i>Moral and Value Education: Principles and Practices</i> , Kanishka Publishers and Distributors, New Delhi 2013.				
2. Colin Wringer, <i>Moral Education: Beyond the Teaching of Right and Wrong</i> , Springer, 2007				
3. Mani Jacob (Ed), <i>Resource Book for Value Education</i> , Institute for Value Education New Delhi 2002.				

4. T. Anchukandam and J. Kuttainimathathil (Ed) *Grow Free Live Free*, Kristu Jyoti Publications, Bangalore, 1995.

SEMESTER - II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBHI2001	Discipline Specific Core Course	HISTORY OF INDIA FROM CE 712 TO 1526	5	4
Course Objectives				
1. To trace the history of the regional states from 7 th to 12 th Century. 2. To study the history of Delhi Sultanate. 3. To analyse the confluence of Islamic Culture on Indian Society. 4. To study the different dynasties of South India and the greatness of Vijayanagara and Bahmani kingdoms.				
Unit-I	Rise of regional States: Background - Regional states - Rajputs Chalukyas - Rashtrakutas - Polity Administration - Society - Economy - Religion - Literature - Art and Architecture		15 Hours	
Unit-II	Delhi Sultanate-I: Invasion of Mahmud Ghazni - Muhammad Ghori - Slave dynasty - Qutbuddin Aibak - Iltutmish - Raziya Sultana - Balban - Khilji dynasty - Jalal-Ud-din Khilji - Alauddin Khilji - His Southern Expeditions - Reforms		15 Hours	
Unit-III	Delhi Sultanate-II: Tughlaq dynasty: Ghiyasuddin Tughlaq - Muhammad bin Tughlaq - His reforms - Firoz Sha Tughlaq - Sayyid and Lodi dynasties.: Polity - Administration - Society - Economy - Religion - Education - Literature - Art and Architecture - Bhakthi and Sufi Movements - Emergence of Composite Culture		15 Hours	
Unit-IV	Southern Regional Kingdoms: Kakatiyas - Yadavas - Hoysalas - Polity - Administration - Society - Economy - Religion - Literature Art and Architecture		15 Hours	
Unit-V	Vijayanagara & Bahmani kingdoms: Sangma - Saluva - Tuluva Aravidu dynasties- Administration - Art and Architecture - Bahmani Kingdom: Bahmani Sultans- Gulbarga and Bidar- Mohamad Gawan-Administration - Art and Architecture - Disintegration of Bahmani Kingdom and Emergence of independent states		15 Hours	

Books for Study:

1. Mahajan V. D., *Ancient India*, S. Chand & Co, New Delhi, 2016.
2. Majumdar R.C., Raychaudri H.C. & Dutta K., *An Advanced History of India*, Macmillan, Chennai, 2004.
3. Satish Chandra, *History of Medieval India, vol.1*, Har Anand Publication, New Delhi, 1997.

Books for Reference:

1. Chitnis, K.N., *Aspects of Society and Economy in Medieval India*, Pune, 1979.
2. Irfan Habib, *Essays in Indian History - Towards a Marxist Perspective*, Tulika, 1995.
3. Nurul Hasan, S., *Religion, State and society in Medieval India*, Oxford University Press, 2005.
4. Basham A. L., *The Wonder that was India*, Rupa & Co, New Delhi, 2001.

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to
CLO1	Understand the values of Moral Education.
CLO2	Learn to live in a multi-cultured society with peace and harmony.
CLO3	Learn the individual qualities necessary for a successful life.
CLO4	Understand the importance and reverence of parents and elders.
CLO5	Know the social values for a harmonious society.

Prepared by: Dr. C. MOHAMED FAHEEM Verified by: Mr. D. Abul Fazal

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO1	Recognize the history of the regional states 7 th to 12 th Century.	K1
CLO2	Understand the history of Delhi sultanate and Sufism.	K2
CLO3	Analyse the impact of Bhakthi Movement on Indian Society.	K4
CLO4	Explain the significance of Vijayanagara kingdoms.	K1
CLO5	Articulate the relevance of Bahmini Empire	K3

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course	Programme Specific Outcomes (PSOs)

Learning Outcomes (CLOs)	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓	✓	✓	✓	✓	✓	✓	✓
CLO 3	✓	✓		✓	✓	✓	✓	✓
CLO 4	✓	✓	✓	✓	✓	✓	✓	✓
CLO 5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches = 39 Correlations: Very High								

Prepared by: Dr. Mohammad Osman Pasha Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
UBHI2002	Discipline specific core course	HISTORY OF TAMIL NADU UP TO CE 1336	4	3
Course Objectives				
1. To be acquainted with the geographical features of Tamil Nadu. 2. To know the political, social and cultural achievements the Sangam age. 3. To make the students to understand the socio-economic condition of ancient Tamil Nadu during the different period namely Sangam Age, Kalabhras, Pallavas, Pandyas, Imperial Cholas. 4. To teach about the early history of Tamil Nadu and the contribution of Chera, Chola, Pallavas and Pandyas to the development of Art and Architecture and Religion.				
Unit-I	Introduction: Influence of Geography and Topography on the history of Tamil Nadu - Sources - Races and Tribes - Dravidians - Pre-history of the Tamils - Aariyanisation of Tamilagam			12 Hours
Unit-II	Sangam Age: Sources Polity - Early Chera, Chola and Pandyas - Administration - Society, Economy and Religion - Education and Fine Art -Sangam Feudatories			12 Hours
Unit-III	Kalabhras And Age Of The Pallavas: Kalabhras Interregnum - Source for the Pallavas - Early Pallavas - Theories of Origin - Kings - Administration - Pallava conflict with Chalukyas and Pandyas - Pallava Rashtrakutas conflicts - Education - Literature - Falls of Pallavas - Bhakthi Movements - Pallava Art and Architecture - Administration and Social life			12 Hours
Unit-IV	Early Pandyas And Imperial Cholas: Sources - First Pandyan Empire - Rise of Imperial Cholas - Parantaka I - Rajaraja I - Rajendra I - Chola Chalukyas conflicts - Kulotunga I - Successors -Literature, Administration, Art and Architecture -			12 Hours

	Decline of the Cholas	
Unit-V	Second Pandyas And Sultanate Of Madurai: Sources - First and Second Pandya Empire - Malik Kafur's invasion - Fall of Pandyan Empire - Founding of Sultanate of Madurai - Fine Arts - Literature - Marco Polo and Abdullah Wassaf	12 Hours
Books for Study 1. Devanesan, <i>History of Tamil Nadu</i>, Benu Publication, Marthandam, 2004 2. Rajayyan, K., <i>History of Tamil Nadu</i>, Madurai, 1982 3. Subramanian, N., <i>History of Tamil Nadu, Vol. I.</i>, Koodal Publishers, Madurai, 1989		

Books for Reference 1. Champakalakshmi R., <i>Trade, Ideology and Urbanization in South India</i>, Oxford University Press 1996 2. Kanakasabai V., <i>The Tamils Eighteen Hundred Years Ago</i>, The South Indian Saiva Siddhanta Work Publishing Society, Tirunelveli Ltd., Chennai, 1956 3. Nilakanta Sastry K.A., <i>A History of South India</i>, Oxford University Press, 1955 4. Noboru Karashima, ed., <i>A Concise History of South India: Issues and Interpretations</i>. Oxford University Press, 2014		

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO1	Understand Geographical features of Tamil Nadu and remember the socio-cultural and economic development of people from the Sangam age.	K2
CLO2	Understand the rise of religious ferment in the 6th Century BCE and the rise of several religious movements.	K2
CLO3	Evaluate the historical significance of tamil literature and recognize the administration of the Pallavas and art of making sculpture during the period.	K5
CLO4	Narrate the Social, Economic, Cultural and Political condition of Tamil Nadu during the Cholas, the establishment of Pandyas and their administration.	K3
CLO5	Analyse the impact of Malik Kafur's invasion.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓		✓	✓	✓	✓
CLO 2	✓	✓		✓	✓	✓	✓	✓
CLO 3	✓	✓	✓	✓	✓	✓	✓	✓
CLO 4	✓	✓	✓	✓	✓	✓	✓	✓
CLO 5		✓			✓	✓	✓	✓
Number of Matches = 35 Correlations: Very High								

Prepared by: Dr. K. Murugan

Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
UBHIAL21	Other Elective Course	TOURISM RESOURCES OF INDIA	5	4
Course Objectives				
1. To focus the availability of various types of tourist potentials in India. 2. Create awareness about the copious natural and man-made tourist attractions in India. 3. To educate the students to identify the tourist spots according to the taste of tourists. 4. To identify the various Fairs and Festivals of India.				
Unit-I	Historical Tourism Resources: Qutub Minar - Fatehpur Sikri - Red Fort - Jantar Mantar - Teen Murti Bhavan - Taj Mahal - Char Dham Yatra - Bodhgaya - Mount Abu - Ajmer Shareef			15 Hours
Unit-II	National Parks and Wildlife Sanctuaries: JimCorbett National Park - Kanha National Park - Kaziranga National Park - Gir Wildlife Sanctuary - Mudumalai Wildlife Sanctuary			15 Hours
Unit-III	Bird Sanctuaries and Waterfalls: Salim Ali Bird Sanctuary - Porbandar Bird Sanctuary - Nalsarovar Bird Sanctuary - Vedanthangal Bird Sanctuary - Waterfalls: Jog Falls - Hogenekkal Waterfalls - Kutralam Waterfalls			15 Hours
Unit-IV	Hill Stations and Beaches: Hill Stations: Shimla - Darjeeling - Nainital - Srinagar - Ooty -Yelagiri - Beaches: Goa Beaches - Havelock Beach, Pondicherry - Marina Beach, Chennai - Kovalam Beach, Trivandrum			15 Hours
Unit-V	Fairs and Festivals: Id-ul-Fitr - Id-ul-Azha -Dassehra - Christmas - Kumbh Mela - Pushkar - Baisakhi - Pongal - Holi - Durga Puja - Diwali - Sankranti - Tourism Fairs			15 Hours
Books for Study				
1. Revathy Girish, <i>Indian Tourist Panorama</i> , Wisdom Press, New Delhi, 2010. 2. D. S. Bhardwaj: <i>Domestic Tourism in India</i> , Indus Publishing Company, New Delhi, 1998. 3. Michael George; <i>Monuments of India, Vol, 1 and 2</i> , London, 1988				
Books for Reference				
4. Manohar Sajnani: <i>Encyclopedia of Tourism Resources in India</i> , Vol - I & II, Kalpaz Publications, Delhi, 2013. 5. Arvind Kumar: <i>Introduction of Travel and Tourism Management & Tourism Resources of India</i> , Walnut Publication, Bhubaneswar, Odisha, 2019. 6. Oki Morihiro: <i>Fairs and Festivals</i> , World Friendship Association, Tokyo, 1988 7. Vikram Bhat: <i>Hill Stations of India</i> , Grantha, U.K, 2011.				

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level

CLO 1	Recognise the historical tourist attractions in India.	K1
CLO 2	Cite famous National parks of India as a tourist potential.	K2
CLO 3	Classify ornithological sanctuaries and waterfalls as a tourist resource in India.	K2
CLO 4	Relate the relevance of fairs and festivals as attracting forces of Tourism.	K4
CLO 5	Identify the various forms of tourist attractions in India.	K1

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓			✓	✓
CLO 2	✓	✓	✓	✓			✓	✓
CLO 3	✓	✓	✓	✓			✓	✓
CLO 4	✓	✓	✓	✓			✓	✓
CLO 5	✓	✓	✓	✓			✓	✓
Number of Matches = 30 Correlations: High								

Prepared by : Mr. P. Basith Assarani

Verified by : Mr. D. Abul Fazal

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
UBHIAL22	Other Elective Course	STUDIES ON STATES AND GOVERNMENTS	3	3
Course Objectives				
1. To learn about the elements of states, unitary state and federal state. 2. To know the classification of Constitution. 3. To highlight on the importance of Democracy. 4. To know the powers and functions of various Organs of the Government and to know about political parties and representation system.				
Unit-I	State: Origin of the State and its Elements - Unitary State and Federal State - Characteristics - Merits and Demerits - Conditions for Federation - Secular State - Welfare State		9 Hours	
Unit-II	Constitution: Definition - Aristotle’s classification - Modern classification - Written and Unwritten constitutions - Flexible and Rigid constitutions - Constitutional changes and Amendment - Judicial Review		9 Hours	
Unit-III	Democracy and Election: Definition - Meaning - Types - Direct and Indirect Democracy - Merits and Demerits - Direct Election - Indirect Election - Political Parties: Origin - Purpose - Types of Party system: Single Party System - Bi-Party System and Multi-Party System - Merits and Demerits		9 Hours	
Unit-IV	Organs of the Government: Legislature: Powers and Functions - Unicameral and Bicameral Legislature - Committee system Executive: Powers and Functions - Parliamentary Executive - Presidential Executive - Plural Executive - Separation of Powers Judiciary: Powers and Functions - Independence of Judiciary - Rule of Law - Administrative Law		9 Hours	
Unit-V	Representation: Theories of Representation - Types of Representation - Proportional Representation - Representation of Minorities - Reserved Constituency-Suffrage - Pressure Groups		9 Hours	
Books for Study				
1. Agarwal.R.C, Political Theory (Principles of Political science), Chand & Company, New Delhi, 2005 2. BiswaranjanMohanty, “Dynamics of Political Theory-The Current Analysis” Atlantic Publishers and Distributors (P) Ltd., New Delhi, 2010 3. Vijayaragavan, Political Thought, New Delhi, Sterling Publications, 2000				

Books for Reference

1. R.G Gettle, *Introduction to political Science*, Ginn and Company, New York, 2019
2. Rajeev Bhargava & Ashok Acharya, *Political Theory: An Introduction*, Pearson, New Delhi, 2019
3. O.P.Gauba, *Western Political Thought*, MacMillan Publishers India Limited, Delhi, 2014
4. Andrew Heywood, *Political Ideologies: An Introduction*, Andrew MacMillan, 2015

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Recognize the Idea about different type of States	K1
CLO2	Classify the Constitutions.	K2
CLO3	Teach the significance of Democracy and Elections.	K3
CLO4	Illustrate the organs of the government and its powers and functions.	K4
CLO5	Assess the systems of representations.	K5

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓	✓	✓	✓			✓	✓
CLO 3	✓	✓	✓	✓			✓	✓
CLO 4	✓	✓	✓	✓			✓	✓
CLO 5	✓	✓	✓	✓			✓	✓
Number of Matches = 32 Correlations: Very High								

Prepared by: Dr. G. Hariharan

Verified by: Mr. D. Abul Fazal

Programme Outcomes for Master of Arts Programme
After the completion of M.A. History programme, the students will be able to

PO 1	Conduct Research independently to bring out new facts and strengthen the existing body of knowledge. Communicate the findings of Research through well-structured Report.
PO 2	Demonstrate domain-specific knowledge and its applications in real-life situations
PO 3	Synthesize learned knowledge and skills to effectively and efficiently perform the job duties of a profession
PO 4	Critically evaluate a situation and suggest a solution after careful consideration of the alternatives
PO 5	Exhibit potential to accomplish tasks independently or as a member or leader of a team
PO 6	Plan and Execute a Project after careful evaluation of the activities involved
PO 7	Develop products, Design Policies, and/or collaborate to help Society in building a Sustainable Environment
PO 8	Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT
PO 9	Identify the need and importance of Human Rights, especially for Women, Children, Bonded Labourers and Refugees.
PO 10	Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

Programme Specific Outcomes (PSO'S) of the PG Programme in History
After the completion of M.A. History programme, the students will be able to

PSO 1	Recognize the historical events of the world and our nation to inculcate the social and individual values and skills required for a successful social life and individual accomplishments.
PSO 2	Compare the variety of resources like archaeological remains, documents, libraries, e resources for documentation and ensure their effective utilization.
PSO 3	Develop the skills to identify the cause and effect of any historical event to evolve conclusions and serve the faculty of History and enhance skills to shine in allied industries.
PSO 4	Develop the aptitude for Research with ability to identify research questions, select appropriate method for analysis to resolve and effective Presentation of conclusions.
PSO 5	Develop the skills to compete for a career in the field of Historical studies as teacher, researcher, other associated professions and also in the allied disciplines like tourism industry as well plan research oriented Higher Education in the field of History and allied disciplines.
PSO 6	Apply soft skills to communicate orally and in written form their view points in an effective manner.
PSO 7	Relate the knowledge of allied disciplines in proper understanding of History and engage in life-long learning of allied disciplines.
PSO 8	Appraise the diversities in the world arising out of a diverse condition and apply the knowledge to contribute for a better world.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10
PSO1		✓	✓		✓	✓	✓		✓	✓
PSO2	✓	✓	✓		✓	✓	✓	✓		
PSO3	✓	✓	✓	✓	✓	✓	✓			
PSO4	✓	✓	✓	✓	✓	✓	✓		✓	✓
PSO5	✓	✓	✓			✓	✓	✓	✓	✓
PSO6		✓		✓	✓	✓	✓			
PSO7		✓		✓	✓	✓		✓		
PSO8	✓			✓	✓	✓	✓	✓	✓	✓
Number of Matches = 59 Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SEMESTER - I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI1001	Discipline Specific Core Course	SOCIAL AND CULTURAL HISTORY OF INDIA UP TO CE1206	6	5
Course Objectives				
1. To study the age-old cultures of India. 2. To study the social and cultural developments during the time of Mauryas, Guptas and the condition of Indian between 2nd Century BCE and 3rd Century CE. 3. To study the developments during the Harsha period. 4. To study the advent of Arabs, the socio-cultural and religious conditions of early Medieval India.				
Unit-I	Pre-History to 6 th Century BCE: Pre- historic Culture - Sources for the history of Ancient India - Salient features of Indus-Valley Civilization-Vedic and later Vedic Age: Society, Economy and Religion - Religious ferment in 6th Century BCE: Jainism and Buddhism - Brahmanism - Vaishnavism and Saivism		18 Hours	
Unit-II	Mauryan Empire: Society, Economy and Religion - Literature - Art and Architecture Kushanas - Indian between 2nd Century BCE and 3rd Century CE: Society, Economy and Religion		18 Hours	
Unit-III	Gupta's Empire: Society, Economy and Religion- Cultural Florescence - Development of Art and Architecture -School of Architecture: Nagara, Vesara and Dravida Style - Paintings: Ajantha and Ellora Style - The Age of Harsha - Society, Economy and Religion-Fahien and Hiuen Tsang Accounts		18 Hours	
Unit-IV	Advent of the Arabs: Socio-Economic and Religiousconditions of India on the eve of Arab Conquest - Impact of Arab Invasion		18 Hours	
Unit-V	India between CE 8 th and 12 th Century: Society - Economy - Religion - Education - Literature - Position of Women - condition of Slaves - Art and Architecture - Invasions of Mahmud Ghazni and Muhammad Ghori and their Impact		18 Hours	
Books for Study				
1.Mahajan, V.D., <i>Ancient India</i> , Sultan Chand, New Delhi, 2000 2. Majumdar R. C., Raychaudhuri H. C., & Datta K., <i>An Advanced History of India</i> Laxmi Publicatin Pvt. Ltd; 2020 3.Upinder Singh, <i>A History of Ancient and Early Medieval India: From the Stone Age to the 12th Century</i> , Pearson, Delhi, 2008.				

Books for Reference

1. Jha, D.N., *Ancient India*, Manohar Publication, New Delhi, 2004
2. Romila Thapar, *Ancient India Social History*, Orient Longman (P) Ltd, New Delhi, 2004
3. Nilakanta Sastri K.A., (ed.) *The Age of the Nandas and Mauryas* (reprint), 1996
4. Romila Thapar, *Ashoka and the Decline of the Mauryas* (rev. ed.), 1997.

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Describe about age old cultures of India.	K1
CLO2	Summarize the causes for religious ferment in the 6th Century BCE and the rise of several religious movements.	K2
CLO3	Articulate the cultural florescence of Gupta's period.	K3
CLO4	Contrast the different Schools of Architecture developed in Ancient India.	K4
CLO5	Appraise the impact of early Muslims invasions of India.	K5

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓	✓	✓	✓	✓	✓		✓
CLO 3	✓	✓	✓	✓	✓	✓	✓	✓
CLO 4	✓	✓	✓	✓	✓	✓		✓
CLO 5	✓	✓	✓	✓	✓	✓		✓
Number of Matches = 37 Correlations: Very High								

Prepared by: Mr. M. Siddique Ahmed

Verified by: Mr. D. Abul Fazal

SEMESTER - I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI1002	Discipline specific core course	SOCIAL AND CULTURAL HISTORY OF TAMILNADU UP TO CE 1565	6	5
Course Objectives				
1. To acquire the knowledge of Sources and the life of the ancient Tamil Civilization				
2. To estimate the Pallavas and Pandyas social and cultural development.				
3. To understand the impact of Jainism and Buddhism on Tamil Society.				
4. To picture the contribution of Imperial Cholas and Vijayanagar Empire in field of Art and Architecture				
Unit-I	Pre-Historic and Sangam Age Settlements: Physical features of Tamil Nadu - Survey of sources - Pre-Historic Age in Tamil Nadu Sangam Age - Fivefold Regions and Occupations - Tamil Kingdoms - Culture of Sangam Age		15 Hours	
Unit-II	Cultural Transformation: Sources for Kalabhras - Cultural impact - Early Pallavas and Pandyas - Administration - Social and Economic conditions - Cultural Transformation - Sculpture and Painting - Bhakti Movements		15 Hours	
Unit-III	Impact of Jainism and Buddhism: Impact of Jainism and Buddhism on Tamil Society - Literary Contribution - Social Contribution - Art and Architecture - Impact on Tamil Society		15 Hours	
Unit-IV	Imperial Chola and Later Pandyas: Local Self-government - Socio-economic conditions- Status of Women - Temples - Trade - Education and Literature - Religious Condition - Art and Architecture - Iconography - Sculpture and Painting		15 Hours	
Unit-V	Vijayanagar Empire: Rise of the Vijayanagar Kingdom -Kumara Kampana’s Southern Expedition - Tamil Country under Vijayanagar Empire - Krishna Devaraya - Battle of Talikota - Impact of the Vijayanagar Rule - Administration - Social and Economic condition- Contribution to Literature, Art and Architecture		15 Hours	
Books for Study				
1. Dr. C. Manoranjithamani, <i>History of Tamil Nadu</i> , Dave-Beryl Publications, Tirunelveli, 2018.				
2. Devanesan, <i>History of Tamil Nadu</i> , Benu Publications, Marthandam, 2004.				
3. Dharmaraj, J., <i>History of Tamil Nadu Up to 2017 (Tamil)</i> , Tensy Publications, Sivakasi, 2017.				
Books for Reference				
1. Pillay K.K, <i>Historical Heritage of the Tamils</i> , MJP Publishers, Chennai, 1979.				
2. Nilakanta Sastry, K.A, <i>A History of South India</i> , Oxford University Press, 1955.				
3. Chandrasekaran P, <i>History of Tamil Nadu up to 1565</i> , Manju Pathippakam, Rajapalayam, 2001.				
4. Sivagananam Ma. Po., <i>History of Freedom movement in Tamil Nadu</i> , Tamil University Publication, Thanjavur,1988.				

COURSE LEARNING OUTCOMES	
CLOs	By the end of the course, the students will be able to
CLO1	Recognise the Historical significance of Pre-Historic and Sangam Age.
CLO2	Evaluate the administration of Kalabhras, Pallavas, Cholas, Pandyas and Vijayanagar Empire.
CLO3	Understand the impact of Jainism and Buddhism in the culture of Tamil Nadu.
CLO4	Analyse the progress of Art, Architecture and Literature of different Tamil Kingdoms.
CLO5	Estimate the Social, Economic and Religious conditions and Art and Architecture. under the Vijayanagar Empire

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓				✓	
CLO 3	✓	✓			✓		✓	
CLO 4	✓	✓	✓	✓	✓		✓	
CLO 5	✓	✓	✓		✓		✓	
Number of Matches = 26 Correlations: High								

Prepared by: Dr. K. Murugan

Verified by: Mr. D. Abul Fazal

SEMESTER - I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI1003	Discipline Specific Core Course	HISTORY OF ANCIENT CIVILIZATIONS (Excluding India)	6	4
Course Objectives				
1. To study pre-historic cultures, the origin and the growth of ancient civilisations.				
2. To study and identify the world important river valley civilizations.				
3. To assess the contribution of civilisations of the Western Part of Fertile Crescent.				
4. To study the legacy of classical civilizations and cite ancient civilisations in America.				
Unit-I	Introduction:Prehistoric Cultures: Palaeolithic, Mesolithic and Neolithic cultures - Origin and growth of Civilizations - Comparison between Culture and Civilization			18 Hours
Unit-II	River Valley Civilisations:Mesopotamian Civilization: Sumerian, Babylonian, Assyrian, and Chaldean Cultures : Political, Social, Economic & Religious conditions - Development of Art & Architecture - Sculpture - Writing (Cuneiform) - literature -Hammurabi Code of Law - Egyptian Civilization: Political, Social, Economic & Religious conditions - Development of Art & Architecture - Sculpture -Writing (Hieroglyphics) and literature			18 Hours
Unit-III	Civilisations of the Western Part of Fertile Crescent: Hebrew Civilization: Government- Art- Religion - Literature and Learning - Phoenician Civilization: Government- Art- Religion - Literature and Learning - Persian Civilization: Government - Art - Religion - Literature and Learning			18 Hours
Unit-IV	Classical Civilizations: Greek Civilisation: The land and the people - Government - Art - Religion and Philosophy - Literature and Learning - Hellenistic Civilization: Salient Features - Roman Civilisation: The land and the people - Government - Art - Religion and Philosophy - Literature and Learning - Chinese Civilisation: The land and the people - Government - Art - Religion and Philosophy - Literature and Learning			18 Hours
Unit-V	Ancient Civilizations in America: Maya Civilization: The land and the people - Political Institutions - Art - Religion - Literature and Learning - Aztec Civilization: Political Institutions - Art - Religion - Literature and Learning - Inca Civilization: Political Institutions - Art - Religion - Literature and Learning			18 Hours
Books for Study				
1. Swain J.E.: A History of World Civilizations, Eurasia Publishing House Pvt.Ltd.,Ram Nagar, New Delhi, 1984				
2. Gokhale, B. K.: Introduction to Western Civilization, S. Chand & Co, New Delhi, 1970				
3. R. K. Majumdar & N. Srivastava: History of World Civilizations				

Books for Reference

1. Will Durant: *The story of Civilizations*, Vol. I & Vol. II
2. Durant, W: *The History of Civilizations our Oriental Heritage*
3. Toynbee, A.J.: *A Study of History* (12 Volumes)
4. Judd, G.P: *History of Civilization*.

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Recognise the pre-historic cultures and the origin and growth of Civilisation.	K1
CLO2	Contrast the terms Culture and Civilization and understand the causes for the rise of civilisations near river valleys.	K2
CLO3	Explain the civilisations of the Eastern and the Western part of Fertile Crescent.	K1
CLO4	Articulate the legacy of classical civilisations.	K3
CLO5	Contrast the contributions of ancient civilisations of America.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓		✓	✓
Number of Matches = 35 Correlations: Very High								

Prepared by: Mr. M. Siddique Ahmed

Verified by: Mr. D. Abul Fazal

SEMESTER -I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI1004	Discipline Specific Core Course	ISLAMIC HISTORY FROM CE 500 TO 750	6	4
Course Objectives				
1. To study the conditions of Pre-Islamic Arabia. 2. To study the life and teachings of Prophet Muhammad (PBUH). 3. To enlighten the sacrifices made by the Prophet Muhammad (PBUH) and his companions. 4. To present the services of Pious Caliphs and the contribution of Umayyad Dynasty.				
Unit-I	Pre-Islamic Arabia: Geography of Arabia: Important Provinces - Inhabitants of Arabia - Jahiliya Period: Political, Social, Economic, Cultural and Religious life of the Pre-Islamic Arabs		18 Hours	
Unit-II	Prophet's Life at Makkah: Parentage, Birth, Early life, and Marriage - Revelation of the Holy Quran - Prophethood - Preaching of Islam - Hostility of Quraysh - Emigrations to Abyssinia - Pledges of Aqaba -Hijrat		18 Hours	
Unit-III	Prophet's Life at Madinah: Establishment of Brotherhood - Constitution of Madinah - Political, Religious and Social institutions - Five Pillars of Islam - Battle of Badr - Battle of Uhud - Battle of Ditch - Treaty of Hudaibiyah - Conquest of Khaybar - Fulfilled Pilgrimage - Battle of Muthah - Conquest of Makkah - Battle of Hunayn - Campaign of Tabuk - The Farewell Pilgrimage - Administration under the Prophet - Prophet as a Multifaceted Personality - Quran and Hadith		18 Hours	
Unit-IV	Pious Caliphate: Hazrat Abu Bakr: His services to Islam - Nomination as Caliph - Condition of Arabia after the demise of the Prophet - False Prophets - Apostasy Movement - His Administration - Hazrat Umar: His services to Islam - Nomination as Caliph - Expansion of Islam and Conquests - Administration - Hazrat Usman: His services to Islam - Nomination as Caliph -Administration - Hazrat Ali: His services to Islam - Nomination as Caliph - Battle of Jamal (Camel) - Battle of Siffin - Administration - Fall of Pious Caliphate		18 Hours	
Unit-V	Umayyad Dynasty: Establishment - Hazrat Amir Muawiyah - Yazid I - Tragedy of Karbala - Abdul Malik and His Reforms - Al-Walid I - Hajjaj bin Yusuf - Umar bin Abdul Aziz - Cultural Progress under the Umayyads: Literature - Art and Architecture - Downfall of the Umayyads		18 Hours	

- ## Books for Reference

- Prepared by: Mr. M. Siddique Ahmed**

Verified by: Mr. D. Abul Fazal

	COURSE LEARNING OUTCOMES	Knowledge Level
CLOs	By the end of the course, the students will be able to	
CLO1	Describe the political, social, economic, cultural and religious life of the pre-Islamic Arabs.	K1
CLO2	Summarize how Prophet Muhammad (PBUH) successfully overcame the ordeals in his mission.	K2
CLO3	Illustrate the establishment of Brotherhood, political, social and religious institutions.	K4
CLO4	Sketch the Administration and expansion of Islam under the Pious Caliphs.	K3
CLO5	Explain the establishment, contributions and the downfall of Umayyad Dynasty.	K1

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓		✓	✓
Number of Matches = 35 Correlations: Very High								

SEMESTER - I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI11	Elective	TRAVEL MANAGEMENT	6	4
Course Objectives				
1. To create awareness about the various types of Transports.				
2. To create awareness about the types/channels of travel agency business.				
3. To create idea about the necessary documents for international passengers.				
4. To create awareness about the necessary formalities in terminals.				
Unit-I	Introduction: Growth of Travel after World War II - Modes of Travel: Roadways, Railways, Waterways and Airways		18 Hours	
Unit-II	Travel Agency: Types of Travel Agency: Whole Sale - Retail - Online - Departments of Travel Agency - Functions of Travel Agency - Travel Guide Book		18 Hours	
Unit-III	Travel Documents: Passport - Types of Passports - Procedure for acquiring Ordinary Indian Passport - Visa - Types of Visas - Health Requirements and Vaccines - Taxes & Travel Insurances: Life Cover, Luggage & Baggage		18 Hours	
Unit-IV	Travel Formalities: Money Exchange & Currency Conversion - Luggage & Baggage Handling - Immigration & Emigration Formalities - Customs Formalities		18 Hours	
Unit-V	Airline Travel Techniques: Fare Constructions: Class of Services - CRS with special reference to Galileo, Amadeus & Sabre - Online Bookings		18 Hours	
Books for Study				
1. Jagmohan Negi, <i>Air Travel Ticketing and Fare Construction</i> , Kanishka Publishers, New Delhi, 2008				
2. Dr. R. C. Ganguly, <i>Travel and Tourism Management-I</i> , Isha Books, New Delhi, 2006.				
3. A.K. Bhatia: <i>The Business of Travel Agency & Tour Operations Management</i> , Sterling Publishers Pvt. Ltd, Noida, U.P, 2020.				
Books for Reference				
1. Md Abu Barkat Ali: <i>Travel and Tourism Management</i> , PHI Learning Pvt Ltd., Delhi, 2015				
2. Biswanath Ghosh: <i>Tourism and Travel Management</i> , Vikas Publishing House Pvt Ltd, New Delhi, 2001				
3. Peter Robinson, Paul Fallan, Harry Cameron & John Crafts: <i>Operations Management in the Travel Industry</i> , CAB International, Oxfordshire, UK, 2019				
4. Ratandeep Singh: <i>Handbook of Tour and Travel Management</i> , Kanshka Publisher, New Delhi, 2018				

Prepared by: Mr. M. Siddique Ahmed

Verified by: Mr. D. Abul Fazal

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO 1	Explain the historical development of various modes transport.	K1

CLO 2	Categorise the types and functions of travel agencies.	K4
CLO 3	Articulate the importance of documentation in travel.	K3
CLO 4	Summarize the travel formalities required for a comfortable travel.	K2
CLO 5	Identify the job potentiality for them in travel industry.	K1

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓		✓	✓	✓	✓
CLO 2		✓	✓		✓	✓	✓	✓
CLO 3		✓	✓	✓	✓	✓	✓	✓
CLO 4			✓		✓	✓	✓	✓
CLO 5		✓	✓		✓	✓	✓	✓
Number of Matches = 31 Correlations: Very High								

Prepared by : Mr. P. Basith Assarani

Verified by : Mr. D. Abul Fazal

COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI12	DSE	PRINCIPLES OF ARCHAEOLOGY	6	4
Course Objectives				
1. To introduce the concept of Archaeology. 2. To understand the relation with other sciences. 3. To know the contribution of Archaeologists. 4. To discuss about the aims and methods of Exploration and Excavation.				
Unit-I	Introduction: An Introduction to Archaeology - Definition, Aims, Nature and scope of Archaeology - Growth of Archaeology - Kinds of Archaeology: Pre-Historic Archaeology - Historical Archaeology - Public Archaeology - Digital Archaeology - Salvage Archaeology - Underwater Archaeology			18 Hours
Unit-II	Archaeology with Other Disciplines: Relationship of Archaeology with other Social and Natural Sciences: History - Anthropology - Geology - Biology - Zoology - Botany - Physics - Chemistry - Linguistics			18 Hours
Unit-III	Contribution of Indian Archaeologists: History and growth of Archaeology in India- Sir William Jones - Colin Mackenzie- Rev. Fr. Heras - S. J. Alexander Cunningham - Lord Curzon - Sir John Marshall - Mortimer Wheeler - Max Muller - B. B. Lal - R. D. Banerji - K. K. Mohammed - Developments since Independence			18 Hours
Unit-IV	Explorations and Excavations: Exploration and Excavation - Aims and Methods - Surface exploration - Aerial Photography - Tools and Equipment's - Methods - Horizontal and Vertical Excavation - Collection and Retrieval of Data 3D Measurements - Drawing of Plan - Section - Pottery - Photography			18 Hours
Unit-V	Methods of Data Collection: Recording and documentation - Methods of artefact analysis: Categorization, Classification and Characterization - Methods of interpretation and related issues - Preparation of Archaeological Reports			18 Hours
Books for Study				
1. Atkinson, R.J.C., <i>Field Archaeology</i> . London: Methuen,1953. 2. Baskar, P., <i>Techniques of Archaeological Excavation</i> . London, 1982. 3. Pearsall, Deborah, M. (Ed.), <i>Encyclopedia of Archaeology</i> , London: Academic Press, 2008				
Books for Reference				
1. Renfrew, C., And Paul Bahn. <i>Archaeology</i> , 2000. 2. Thames and Hudson., <i>Theories, Methods, and Practice</i> . London. 3. Robert, H. Brill (Ed.), <i>Science and Archaeology</i> . London, 1971. 4. Sankalia, H.D., <i>Indian Archaeology Today</i> . Bombay, 1962.				

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO1	Describe the significance of Archaeology and understand the relationship between Science and Archaeology.	K1

CLO2	Identify the contributions of Eminent Archaeologists and also know about the Surface exploration.	K1
CLO3	Understand the Collection and Retrieval of Data 3D Measurements.	K2
CLO4	Categorise the methods of data collection in Archaeology.	K4
CLO5	Take part in the Preparation of archaeological reports.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓		✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	
CLO 4		✓	✓	✓	✓	✓	✓	
CLO 5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches = 33 Correlations: Very High								

Prepared by: Dr. Mohammad Osman Pasha

Verified by: Mr. D. Abul Fazal

SEMESTER - I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI13	DSE	HISTORY OF PEASANT AND LABOUR MOVEMENT IN MODERN INDIA	6	4
Course Objectives				
1. To impart the knowledge about the nature and scope of Peasant and Labour Movements. 2. To expose students about the Peasant struggle in India 3. To make them understand the important various peasant organisation in India. 4. To develop the knowledge of the growth of Trade Unions and its activities and the effects of Trade Union in Non Indian economy.				
Unit - I	Introduction: Agricultural conditions and Agrarian structure in India during the British Period - Colonial Policies - Nature and Scope of Peasant Revolts in India - Regional Variations - Tribal and Peasant Societies - Historiography of Labour and Peasant Movements		18 Hours	
Unit - II	Peasants Struggles in India: Kerala and Land reforms since 1900 - Peasants Uprising in India in the 19th Century - Peasants Unions - Indian National Congress and Peasants Struggles - A survey of Peasant Revolts - Indigo - Moplah - Pabna - Deccan Riots - Champaran - Bardoli - Tebhagh Movement - Telengana Peasant Outbreak (1946-51) - Varlis Revolt in western India		18 Hours	
Unit - III	The Rise and Growth of Peasant Organisations: Kisan Sabha - Provincial Peasant Organizations - Bengal - Bihar - Punjab - Kerala - Andhra - Peasant Organization in Tamil Nadu - Tamizhaga Vivasayigal Sangam - Peasant Movement in Vadasendur - Welfare Measures for Peasants - Integration of Peasantry into the Nationalist Movement		18 Hours	
Unit - IV	Labour Movements and its impact on Indian Freedom Struggle: Trade Union Movement - Establishment of All India Trade Union Congress - Growth of Trade Union Movement - The role of Indian National Congress in the expansion of Trade Union Movement- Role of Labours in freedom struggle - Dr. Ambedkar and Labour Welfare Measures		18 Hours	
Unit - V	Labour Unions in Independent India: AITUC, INTUC, HMS.UTUC, CITU, BMS - Labour Laws - International Labour Organization - Labour Welfare Measures in Independent India - Trade Unions and its effect on Indian economy		18 Hours	
Books for Study				
1. S.Shahin: <i>Peasant and Peasant Societies</i> published by Blackwell, 1987. 2. A.R. Desai: <i>Peasant struggle in India</i> published by Bombay: Oxford university press, 1979. 3. Rajiv Ahir: <i>A Brief History of Modern India</i> published by Spectrum Books LTD, New Delhi, 2019.				

Books for Reference

1. D.N. Dhanagare: *Peasant Movement in India 1920-1950* published by Oxford University Press, 1991.
2. S.M. Pandey: *Emergence of Peasant Movement in India* published by Shri Ram Centre for Industrial Relation and Human Resources.
- 3 **L. Natarajan: *Peasant uprisings in India, 1850-1900* published by Bombay: People's Pub. House, 1953.**
4. D. John Paul: *Trade union leaders and labour movement in India* published by MJP Publishers.

CLOs	COURSE LEARNING OUTCOMES By the end of the course, the students will be able to	Knowledge Level
CLO1	Identify the basic concepts related to peasant and labour movements.	K1
CLO2	Summarize the important Peasants uprisings in India.	K2
CLO3	Articulate the evolution and growth of important Peasant Organizations in India.	K3
CLO4	Interpret the role of Labour Movements in Indian Independence.	K2
CLO5	Illustrate the impact of various Trade Unions on Indian economy.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓		✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓			✓
Number of Matches = 33 Correlations: Very High								

Prepared by: Mr. Md Ghufan. R

Verified by: Mr. D. Abul Fazal

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI2001	Discipline Specific Core Course	SOCIAL AND CULTURAL HISTORY OF INDIA FROM CE 1206 TO 1857	5	5
Course Objectives				
1. To inform about the relevance of Medieval Indian History in Indian History 2. To instruct on the different historical narratives with regard to Medieval Indian History 3. To apprise on the contribution of Medieval India to the nation and the world 4. To impart knowledge with focus on competitive examinations and Higher Education				
Unit - I	Delhi Sultanate: Sources - Ruling Classes - The Ulema - Trading and Financial Classes - Standard of Living - Town Life - Women - Caste - Social manners and customs - Agriculture - Non-Agricultural Production - Trade - Religion - Sufi and Bhakthi Movement - Art - Architecture - Literature		15 Hours	
Unit - II	Vijayanagar Kingdom: Sources -Society - Economy - Religion - Literature - Art - Architecture		15 Hours	
Unit - III	Bahmani Kingdom: Sources - Society - Economy - Religion - Literature - Art - Architecture		15 Hours	
Unit - IV	Mughal Empire: Sources -Economic and Social Conditions - Standard of Living - Pattern of Village life and the Masses - The Nobles and Zamindars - The Middle Class - Trade and Commerce - Foreign Trade - Architecture - Painting - Language and Literature - Music		15 Hours	
Unit - V	European Penetration: Growth of Indology - Social and Cultural Policy of East India Company - Activities of Christian Missionaries - Growth of Humanitarianism - Education in Colonial India: Traditional Educational System - Introduction of Western Education - Wood's Despatch - Universities of 1857		15 Hours	
Books for Study				
1. Chandra, Satish: <i>Essays on Medieval India History</i> , Oxford University Press, New Delhi, 2004. 2. Chandra, Satish: <i>Medieval India from Sultanate to Mughal - Part - 1,1206 - 1526</i> , Har Anand Publications, New Delhi,1975. 3. Mahajan, V.D.: <i>History of Delhi Sultanate</i> , Sultan Chand, New Delhi, 2000.				
Books for Reference				
1. Basham, A.L.: <i>A Cultural History of India</i> , Oxford University Press, New Delhi, 2006 2. Bose, M.L.: <i>Social and Cultural History of India</i> , Concept Publication, New Delhi, 1989 3. Majumdar, H.C. Raychaudhuri & K. Dutta: <i>An Advance History of India</i> , Macmillan India Limited, 2004, New Delhi 4. Sharma L. P.: <i>History of Medieval India</i> . Konark Publishers Pvt. Ltd., 1997, Delhi				

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to	Knowledge Level
CLO1	Identify the significance of the Delhi Sultanate rule to Indian Civilization and Culture.	K1
CLO2	Summarize the contribution of the Vijayanagar Empire to social and cultural growth.	K2
CLO3	Articulate the importance of Bahmani Kingdom in Indian History.	K3
CLO4	Relate the relevance of Mughal Empire to contemporary India.	K4
CLO5	Appraise the contribution of the Europeans for the promotion of Education.	K5

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓		✓	✓
Number of Matches = 35 Correlations: Very High								

Prepared by: Mr. D. Abul Fazal
Abul Fazal

Verified by: Mr. D.

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI2002	Discipline Specific Core Course	SOCIAL AND CULTURAL HISTORY OF TAMILNADU FROM CE 1565 TO 2016	6	5
Course Objectives				
1. To discuss about the Socio-Cultural condition of Medieval and Modern Tamil Nadu.				
2. To analyze the importance of Reform Movements in Tamil Nadu.				
3. To develop an understanding of the social issues, discussing customs and reforms in Tamil Nadu.				
4. To acquaint the importance of Dravidian Movement in promoting Social Justice and to discuss the administration of Rajaji and Kamaraj.				
Unit - I	Nayakas, Marathas and Carnatic Nawabs: Sources - Social and economic conditions - Religious condition - Education and literature - Art and architecture		18 Hours	
Unit - II	Freedom Movement in Tamil Nadu: Earlier Attempts - Pooli Thevar - Veerapandya Kattabomman - Poligar Rebellion - South Indian Rebellion - Vellore Mutiny - Swadesi Movement - Non-Cooperation Movement - Civil Disobedience Movement - March to Vedharanyam - Quit India Movement - V. O. Chidambaram Pillai - V. V. Subramaniam - Vanchinathan - Subramania Bharathi - C. Rajagopalachari - Satyamurti		18 Hours	
Unit - III	Social Reform Movements: Justice Party - Self-Respect Movement and Periyar - Dravidakhalagam - Women Movements and Social Legislations - Anti-Hindi Agitations - Educational Policies		18 Hours	
Unit - IV	Tamil Nadu under Congress Governments: Contribution of Rajaji - Kamaraj - Growth of Education - Mid-day Meal Scheme and its impact - Land reforms and social welfare- Rise of regional politics and its impact - Anti-Hindi Agitations		18 Hours	
Unit - V	Tamil Nadu under Dravidian Rule: Rise of DMK to power - C. N. Annadurai - M. Karunanidhi - Rise of AIADMK to power - M. G. Ramachandran and his Administrative reforms - J. Jayalalitha - Social welfare schemes - Planning Commission - Social Justice and Reservation policies - Industrial growth - Impact of Globalization		18 Hours	
Books for Study:				
1. Subramanian N, History of Tamil Nadu A.D 1565 - 1956, Koodal Publications, Madurai				
2. Rajayyan K, History of Tamil Nadu (1565 - 1982), Raj Publishers, Madurai, 1982				
3. Jeyapalan N, Social and Cultural History of Tamil Nadu. Atlantic Publishers, Chennai				

Books for Reference:

1. Nambiaroran, K.A, *Tamil Renaissance and Dravidian Nationalism*, Madurai, 1980
2. Rajaraman P, *The Justice Party, 1916-1937*, Poompozhi Publishers, Madras 1988
3. Chellan V.T, *ThamizhagaVaralumPampadum*(Tamil), ManivasagaPathipagam, Chennai, 2005
4. Pillay. K.K, *A Social History of the Tamils*, University of Madras, Chennai, 1969

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Explain the rule of Nayakas, Marathas and Carnatic Nawabs.	K1
CLO2	Illustrate the Independence Struggle and Movements in Tamil Nadu and the prominent leaders.	K4
CLO3	Interpret the social reform movement and its impacts	K2
CLO4	Articulate the role of Congress Ministries in Tamil Nadu.	K3
CLO5	Relate the significance of the rule of Dravidian parties.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓			✓
CLO 2	✓	✓	✓	✓	✓			✓
CLO 3	✓	✓	✓	✓	✓			✓
CLO 4	✓	✓	✓	✓	✓			✓
CLO 5	✓	✓	✓	✓	✓			✓
Number of Matches = 30 Correlations: High								

Prepared by: Dr. K. Murugan

Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI2003	Discipline Specific Core Course	HISTORY OF MEDIEVAL CIVILIZATIONS	6	4
Course Objectives				
1. To study Christianity and Papacy in Medieval Europe. 2. To study the legacy of Islam. 3. To study the development of Feudalism in medieval Europe. 4. To study the life in Medieval Europe and the rise of medieval Universities.				
Unit-I	Christianity:Rise and Spread of Christianity - The Papacy - Monastic Orders: Byzantine and Benedictine Monasticism - Monastic Reforms - Contribution of Byzantine Empire		18 Hours	
Unit-II	Islamic Civilization:Rise of Islam - Teachings of Islam - Islamic Empires - Administrative features of Pious Caliphate - Literature and learning - Development of Science - Contribution of Islam to Humanity		18 Hours	
Unit-III	Feudalism:Origin - Feudal Hierarchy: Lord, Vassal and Knighthood - Merits and demerits of Feudalism - Crusades - Causes and results of Crusades		18 Hours	
Unit-IV	Medieval Europe:Life in Medieval Cities - Markets, Guilds, Municipal Services and methods of crimes		18 Hours	
Unit-V	Medieval Universities:Important Universities - Subjects of study - Relation between Teachers and students - Life in the Medieval Universities		18 Hours	
Books for Study				
1. R. K. Majumdar & N. Srivastava: History of World Civilizations,2021 2. Wall blank, T.W: Civilization- Past and Present,2010 3. Will Durant: The story of Civilizations, Vol-I & Vol-II, 2016				
Books for Reference				
1. Edward., History of World Civilizations, 2011 2. Judd, G.P: History of Civilization, 1966 3. Will Durant: The Story of Civilisation (Vol. I & II),2010 4.R.K. Jha, History of world Civilization, 2012				

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Explain the relationship between the State and the Church in the Middle Age.	K1
CLO2	Summarize the birth of Islam and the contribution of Pious Caliphates.	K2
CLO3	Conclude the origin, nature, hierarchy and the legacy of the Feudalism in Medieval Europe.	K4
CLO4	Relate the life in Medieval Europe.	K3
CLO5	Illustrate the establishment and contributions of Medieval Universities.	K1

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓		✓		✓	✓
CLO 2	✓	✓	✓		✓		✓	✓
CLO 3	✓	✓	✓		✓		✓	✓
CLO 4	✓	✓	✓	✓	✓	✓	✓	✓
CLO 5	✓		✓		✓		✓	✓
Number of Matches = 31 Correlations: Very High								

Prepared by: Dr. G. Harigaran

Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI2004	Discipline Specific Core Course	ISLAMIC HISTORY FROM CE 750 TO 1258	5	4
Course Objectives				
1. To study the establishment, administrative features and scientific developments during the Abbasid Rule.				
2. To discuss the causes, course and results of the Crusades.				
3. To study the cultural progress under the Moors in Spain.				
4. To study the cultural contribution of the Fatimids of Egypt.				
Unit-I	Abbasid Rule I: Establishment of the Dynasty - Abbasid Revolution - Abul Abbas as-Saffah - Unique features of the Abbasids Rule - Abu Jafar al-Mansur: Conquests - Contribution - Al-Mahdi - Al-Hadi		15 Hours	
Unit-II	Abbasid Rule II: Harun al-Rasheed: Rise and fall of Barmakids - Administration - Character - Mamun al-Rasheed: Civil war between al-Ameen and al-Mamun - Achievements - Al-Mutawakkil: Achievements - Contribution of Arabs to Science - Muslims Scientists and Historians - Downfall of Abbasids		15 Hours	
Unit-III	Crusades: Causes and Course of the Crusades - ImaduddinZengi - Conquest of Edessa - Nuruddin Mahmud - The Second Crusades - Expedition of Egypt - Sultan Salahuddin Ayyubi - Results of the Crusades		15 Hours	
Unit-IV	Moors in Spain: Abdul Rahman I: Administration - Character and Achievements - Abdul Rahman II: Character and Achievements - Abdul Rahman III: Administration - Character and Achievements - Development Education, Science and Technology, Literature, Art and Architecture		15 Hours	
Unit-V	Fatimids of Egypt: Establishment - Ubaydullah Al-Mahdi - Conquests - Al-Muiz: Accession and conquests - Al-Aziz: Accession and conquests - Cultural Contribution - Downfall of the Fatimids		15 Hours	
Books for Study				
1. Ameer Ali Syed, <i>The Spirit of Islam</i> , Idara -I - Adabiat - I - Delli, New Delhi, 1997.				
2. Ameer Ali Syed, <i>History of the Saracens</i> , Kitab Bhawan, New Delhi, 1995.				
3. Syed Shahabuddeen Dr., <i>Islamia VaralarumPanpadum</i> (Tamil), Ahmed Publications, Vaniyambadi, 2001.				

Books for Reference

1. Abbas Ali, *Civilization in Islam*, Reference Press, New Delhi, 2005.
2. Arnold Thomas, *The Legacy of Islam*, Oxford University Press, London, 1980.
3. Hitti Philip. K., *History of Arabs*, MacMillan India, New Delhi, 1974.
4. Syed Shahabuddeen Dr., *Contributions of Muslims to Humanity*, Vijay Nicole Imprints Pvt. Ltd. Chennai, 2016.

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to	Knowledge Level
CLO1	Explain the growth and progress of Human civilizations under the Abbasids, Fatimids and Moors in Spain.	K1
CLO2	Interpret the scientific developments under the Abbasids.	K2
CLO3	Summarize the causes, course and results of the Crusades.	K3
CLO4	Conclude the cultural progress under the Moors in Spain and Fatimids of Egypt.	K4
CLO5	Value the Muslims contribution to Humanity.	K5

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓		✓	✓
Number of Matches = 35 Correlations: Very High								

Prepared by: Dr. C Mohamed Faheem
Fazal

Verified by: Mr. D. Abul

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHR2001	Value Based Course	HUMAN RIGHTS	2	-
Course Objectives				
1. To train the students on basic concepts of Human Rights 2. To inform the students on the provisions of the international covenants and Declarations 3. To instruct on the National and International organisations of Human Rights 4. To Sensitize the students on the contemporary Human Rights issues in India				
Unit - I	Introduction: Definition and Meaning -Need for study of Human Rights - Nature and Scope of Human Rights - Kinds of Human Rights		6 Hours	
Unit - II	International Declaration and Covenants: Universal Declaration of Human Rights -International Covenant on Civil and Political Rights - International Covenant on Social and Cultural Rights - Optional Protocol to the International Covenant on Civil and Political Rights - International Human Rights Conventions		6 Hours	
Unit - III	Human Rights Organisations: United Nations Commission on Human Rights - Human Rights Council - United Nations Commissioner for Human Rights - Office of the High Commissioner for Human Rights - National Human Rights Commission - Tamil Nadu State Human Rights Commission		6 Hours	
Unit - IV	Non-Governmental Organisations: Amnesty International - Anti Slavery International - Human Rights Information and Documentation Systems International (HURIDOCs) - National Campaign on Dalit Human Rights - Wada Na Todna Abhiyan		6 Hours	
Unit - V	Issues of Concern with National and International Perspective: Gender Issues - Child Rights - Rights of Refugees - Caste Discrimination - Rights of Minorities - Indian Constitution and Human Rights		5 Hours	
Books for Study				
1. Basu L. N, <i>Human Rights in a Global Perspective</i> ,Aavishkar Publishers, 2003. 2. Begum Mehartaj S, <i>Human Rights in India: Issues and Perspectives</i> , APH Publishing Corporation, New Delhi, 2000. 3. Mohanasundaram, K, <i>Human Rights: Theories and Practice</i> , Concept Publishing Company (P) Ltd., New Delhi, 2013.				
Books for Reference				
1.Goswami B, ed., <i>Human Rights and Reforming the Law</i> , Raj Publishing House, Jaipur, 2008. 2. Rekha Roy, <i>Women's Rights in India: A Feminist Perspective</i> , Akasha Publishing House, New				

Delhi, 2006.

3. Ram Ahuja, *Social Problems in India*, Rawat Publications, Jaipur ,1999.

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to	Knowledge Level
CLO1	Identify the basic concepts of Human Rights.	K1
CLO2	Summarize the provisions of the International Declarations and Covenants.	K2
CLO3	Use the information regarding the International and National Human Rights Organisations for a better use.	K3
CLO4	Categorize the various Non-Governmental Organizations involved in securing Human Rights.	K4
CLO5	Appraise on the National and International issues of Concern.	K5

Prepared by: Mr. D. Abul Fazal

Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI21	Discipline Specific Elective Course	HOTEL MANAGEMENT	6	4
Course Objectives				
1. To educate the students about the History of Hotels and its classification on various parameters on the basis of changing trends in the Hospitality Industry.				
2. To present students above the Front office and its function.				
3. To study the Housekeeping and its procedure.				
4. To study the departments of hotel.				
Unit-I	History of Hotels and its Classification: History of Hotels - Origin and growth of Hotel Industry in India - Classification of Hotels		18 Hours	
Unit-II	Front Office: Meaning - Departments - Functions - Organization -Duties and responsibilities		18 Hours	
Unit-III	Housekeeping Procedures: Meaning - Importance of House Keeping - Functions: Making Beds - Tidying Rooms - Cleaning and Polishing - Washing and Removing Stains - Vacuuming - Gardening		18 Hours	
Unit-IV	Food and Beverages: Food and Beverage Service: Quick Service -Table Service - Specialty Restaurants - Coffee Shops - Buffets and Banquets - Wedding and Birthday Services		18 Hours	
Unit-V	Miscellaneous Functions: Other Departments of a Hotel: Sales and Marketing Division, Purchase Division, Accounting Division, Engineering and Maintenance Division, Security Division, Human Resources Division		18 Hours	
Books for Study				
1.James A Bardi: Hotel Front Office Management,2012				
2. R. Singaravelan: Food and Beverage Service, Oxford Higher Education,2011				
3. Front Office Manual: TATA McGraw Hill Publications, 2013				
Books for Reference				
1.V Prakash Kainthola, principles of Hotel Management, Gyan Books Pvt. Ltd, New Delhi, 2006.				
2. Jatashankar R. Tewari, Hotel Front Office: Operations and Management, Oxford University Press, India, June 2009				
3. Alan T Stutis, James F Wortman: Hotel and Lodging management,2001				
4. Tarun Bansal, Hotel Facility Planning,Oxford University Press, New Delhi, 2010				

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Understand the services available in the Star hotels.	K2
CLO2	Explain the Front Office procedures, the manners and etiquette followed by the Front office staffs in the Hotel Industry.	K1
CLO3	Describe the housekeeping procedures and the importance of cleanliness in the Hotel industry.	K1
CLO4	Compare the various types of Food and Beverage services available in the Hotels.	K2
CLO5	Relate the essential departmental functions in hotel industry.	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓		✓		✓	✓	✓	
CLO 2	✓		✓		✓	✓	✓	✓
CLO 3	✓		✓		✓	✓	✓	✓
CLO 4	✓		✓		✓	✓	✓	
CLO 5	✓		✓		✓	✓	✓	
Number of Matches = 27 Correlations: High								

Prepared by: Dr. G. Harigaran

Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI22	Discipline Specific Elective Course	INTRODUCTION TO EPIGRAPHY AND NUMISMATICS IN INDIA	6	4
Course Objectives				
1. To impart the knowledge about the nature and scope of Epigraphy and Numismatics				
2. To expose students about the Coinage of different writing scripts.				
3. To make them understand the important inscriptions in India.				
4. Students to develop the knowledge of different coinage of ancient India.				
Unit-I	Introduction to Indian Epigraphy: Definition and importance of Epigraphy - Epigraphy as source material: Political, Cultural, Economic and Religious History - Literary and Archaeological Evidence		18 Hours	
Unit-II	Origin and Antiquity of Writing in India: Writing Material in Ancient India - Antiquity of writing in India and the Indian subcontinent - Materials and techniques of writing - The Brahmi Script - Kharosthi Script - Tamil Scripts - Telugu, Kannada and Malayalam Scripts - Evolution of Persian, Arabian Inscriptions		18 Hours	
Unit-III	Indian Inscriptions: General contents and Format of Inscriptions - Types of Inscriptions - Select Inscriptions - Erragudi Edict of Asoka - Hathigumpa Inscription of Kharavela - Allahabad Pillar Inscription of Samudragupta - Aihole Inscription of Pulakeshin II - Uttiramerur Inscription of Parantaka I		18 Hours	
Unit-IV	Introduction of Money and Antiquity of Coinage in India: The Currency Definition and basic principles - Ancient Indian Coins - Punch Marked Coins - Barter System - Local Series - General Characteristics - Metal Fabric - Metallurgy - Symbols		18 Hours	
Unit-V	Early Coins of South and Western India: Indo-Greek Coins - Indo-Scythian and Indo-Parthian Coins - Coinage of Kushanas - Western Satraps - Coinage of Guptas - Coins of South India: Satavahanas -Chalukyas - Cholas - Pāndyas - Cheras - Medieval Indian Dynasties		18 Hours	
Books for Study				
1.Allen John, <i>Catalogue of Coins of Ancient India</i> , British Museum, London, 1936.				
2.Altekar A.S., <i>Coinage of the Gupta Empire</i> , Numismatics Society of India, Varanasi, 1957.				
3. D.C Sarkar. <i>Indian Epigraphy</i> . Motilal Banarasidas Publication,1966.				
Books for Reference				
1. Chattopadhyay and Brajadulal, <i>Coins and Currency Systems in South India</i> . New Delhi, 1977.				

2. Desikachari, T., *South Indian Coins*, Trichinopoly, 1933.
3. *Epigraphy of India and its Persian and Arabic series of the A.S.I.*
4. Yazdani: *Medieval Indian Epigraphy* Cambridge University Press, 1960.

CLOs	COURSE LEARNING OUTCOMES	Knowledge Level
	By the end of the course, the students will be able to	
CLO1	Illustrate the significance of Epigraphy.	K1
CLO2	Classify the writing materials in Ancient India.	K2
CLO3	Contrast the important Inscriptions of India.	K4
CLO4	Summarise the evolution of coinage in India.	K2
CLO5	Categories Ancient South Indian Coins	K4

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓	✓	✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓	✓	✓	✓
CLO 3	✓	✓	✓	✓	✓	✓	✓	
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓	✓	✓	✓	✓	✓	
Number of Matches = 36 Correlations: Very High								

Prepared by: Dr. Mohammad Osman Pasha Verified by: Mr. D. Abul Fazal

SEMESTER - II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS./ WEEK	CREDIT
PBHI23	Discipline Specific Elective Course	MAKERS OF MODERN INDIA - I	6	4
Course Objectives				
1. Describe the reformist ideas of social thinkers 2. Explain the contributions to the religious world 3. Concept of moral foundations of political authority. The political structures based on justice, generosity and humanity 4. Explain the contribution of various Indian scientists 5. Explain the contribution of Indian litterateurs				
Unit-I	Social Thinkers: Introduction - Raja Ram Mohan Roy - Iswar Chandra Vidya Sagar - Keshab Chandra Sen - Veerasalingam Pantulu - D. K. Karve - R. G. Bhandrakar - Pandita Ramabai Ranade - Jothiba Phule - Sir Syed Ahmed Khan - Iyothee Thass		18 Hours	
Unit-II	Religious Thinkers: Debendranath Tagore - Swami Dayanand Saraswati - Ramakrishna Paramahansa - Swami Vivekananda - Saint Ramalinga Adigal - Maulana Qasim Nanotavi- Maulana Rashid Ahmed Gangohi		18 Hours	
Unit-III	Political Thinkers: Dadabhai Naoroji - M. G. Ranade - S. N. Banerjee - R. C. Dutt - G. K. Gohkale		18 Hours	
Unit-IV	Scientists: J. C. Bose - P. C. Roy - Srinivasa Ramanujan - Rupa Bai Furdoonji		18 Hours	
Unit-V	Litterateurs: Bankim Chandra Chatterjee - Rabindranath Tagore - Savitribai Phule - Allama Iqbal - Bipin Chandra Pal - Munshi Premchand		18 Hours	
Books for Study				
1. Ramachandra Guha: <i>Makers of Modern India</i> , Penguin India, 2012. 2. N. Jayapalan: <i>Makers of Modern India</i> , Book Enclave, 2006. 3. Gagan Jain: <i>Indian Scientists</i> , Maanu Graphics Publications, 2014.				
Books for Reference				
1. Datta, K. K: <i>A Social History of Modern India</i> , The Macmillan Company, New Delhi, 1975. 2 Naravane, V. S: <i>Modern Indian Thought</i> , Orient Longman, New Delhi, 1978. 3. Jagjit Singh: <i>Some Eminent Indian Scientists</i> , Publications Division, 2017. 4. Vishnoo Bhagwan : <i>Indian Political Thinkers</i> , Atma Ram & Sons, New Delhi, 1999.				

CLOs	COURSE LEARNING OUTCOMES By the end of the course the students will be able to	Knowledge Level
CLO1	Identify the reformist ideas of social thinkers.	K1
CLO2	Articulate the ideas and teachings of the religious reformers.	K3
CLO3	Illustrate the moral foundations of Indian political thought.	K4
CLO4	Summarize the contribution of various Indian scientists	K2
CLO5	Appraise the various literary works.	K5

Mapping of Course Learning Outcomes with Programme Specific Outcomes

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CLO 1	✓		✓	✓	✓		✓	✓
CLO 2	✓	✓	✓	✓	✓		✓	✓
CLO 3	✓	✓	✓	✓	✓		✓	✓
CLO 4	✓	✓	✓	✓	✓		✓	✓
CLO 5	✓	✓			✓	✓	✓	✓
Number of Matches = 33 Correlations: Very High								

Prepared by: Mr. MD Ghufan R

Verified by: Mr. D. Abul Fazal

**DEPARTMENT OF BUSINESS
ADMINISTRATION**

POS FOR BBA

1. Communicate ideas, thoughts & knowledge through English effectively with individuals, groups and businesses using verbal, non-verbal and digital modes of communication develop linguistic skills in any Indian/ regional language.
2. Demonstrate knowledge of the concepts, principles, theories and techniques related to various forms, facets and functions of Business.
3. Synthesize learned knowledge and acquired skills to establish, organize, manage and develop a business/ organization effectively and efficiently being an entrepreneur, businessman or professional
4. Critically evaluate a problem/ environment and take informed business decisions to solve problems.
5. Exhibit potentials to accomplish tasks independently, as a team member or team leader.
6. Use Computers, Software, Internet, and other ICT Tools to maximize resource utilisation and increase efficiency in day-to-day business operations.
7. Plan, execute, and manage a Project after careful appraisal.
8. Develop products, frame policies, and collaborate to help society in increasing the living standards and building a sustainable environment.
9. Discover a passion for lifelong learning (through MOOCs, ODL, and Self Learning Techniques) through optimum use of ICT.
10. Identify and assess various issues in environment, and suggest measure to overcome them. Exhibit ethics and values in professional, social and personal spheres of life, caring for the underprivileged, leading to a better sustainable future.

PSO (BBA)

At the end of the BBA Programme, the student will be able to:

PSOs (BBA)	POs (B.Com/BBA)										
	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	TOTAL (80)
PSO ₁	✓	✓	✓	✓	✓	✓	✓	✓		✓	9
PSO ₂	✓	✓	✓	✓	✓	✓	✓	✓		✓	9
PSO ₃	✓	✓	✓	✓	✓	✓	✓	✓		✓	9
PSO ₄		✓	✓	✓	✓		✓	✓	✓	✓	8
PSO ₅		✓	✓	✓	✓	✓	✓	✓	✓		8
PSO ₆	✓	✓	✓		✓		✓	✓	✓		7
PSO ₇	✓	✓	✓		✓	✓	✓		✓	✓	8
PSO ₈	✓	✓	✓			✓	✓	✓	✓		7
TOTAL	6	8	8	5	7	6	8	7	5	5	65
No. of Matches = 65 Mapping = 81%						Correlation = Very High					

1. Communicate management principles, thoughts and ideas effectively with individuals, groups and organizations.
2. Demonstrate knowledge of Management concepts, principles, theories and techniques related to finance, HR, production and marketing.
3. Synthesize learned Knowledge and acquired skills to plan, organize, direct and control a business or organization, effectively and efficiently as an entrepreneur, businessman or professional.
4. Critically evaluate problems related to Work-Life and take appropriate decisions to solve the problems.
5. Exhibit potentials to accomplish professional tasks independently, as a team member and/or team leader.
6. Develop products and services; collaborate with organizations to help society in increasing the living standards and building a sustainable environment.

7. Identify, plan, execute, and manage projects after careful appraisal with professional ethics and values.
8. Use online / offline information & communication tools and technologies and develop passion for lifelong learning through MOOCS, ODL, and self learning techniques.

BBA SYLLABI 2022-23 SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBBA1001	DSC	FINANCIAL ACCOUNTING I	7	6
Course Objectives				
1. Enlighten the students with various Concepts of Accounting. 2. Impart knowledge of Accounting Principles & Conventions. 3. Teach practical knowledge in the Preparation of Accounts 4. Educate students about Depreciation, Insurance and Partnership.				
Unit-I	Accounting Framework			21 Hours
Conceptual Framework: Accounting Principles - Accounting Concepts - Accounting Conventions – Introduction to AS, Ind-AS & IFRS – Accounting Process: Journal – Ledger – Trial Balance – Meaning and Types of Accounting Errors. Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Adjustments in Final Accounts: Outstanding Expenses – Prepaid Expenses – Accrued Income - Income Received in Advance - Depreciation and Appreciation of Fixed Assets – Interest on Capital – Interest on Drawings.				
Unit-II	Depreciation Accounting & BRS			21 Hours
Depreciation – Causes – Methods of providing Depreciation – Straight Line Method – Diminishing Balance Method – Annuity Method – Sinking Fund Method (Simple Problems only). Bank Reconciliation Statement – Meaning – Need – Preparation of Bank Reconciliation Statement.				
Unit-III	Average Due Date and Fire Insurance Claims			21 Hours
Average Due Date – Determination of Due Date – Calculation of Interest. Meaning of Fire Insurance – Need for Fire Insurance – Computation of Claims to be lodged for loss of stock – Average Clause.				
Unit-IV	Single Entry System			21 Hours
Single Entry System – Objectives – Features – Limitations – Differences between Single Entry and Double Entry System – Ascertainment of Profits through Net worth Method (Statement of Affairs) and Conversion Method.				
Unit-V	Partnership Accounts			21 Hours
Partnership – Features – Types of Partners - Admission of a Partner – Retirement of a Partner - Calculation of New Ratio, Sacrificing Ratio & Gaining Ratio – Calculation of Goodwill – Preparation of Revaluation Account, Capital Account and Balance Sheet at the time of Admission and Retirement. Dissolution - Meaning – Modes - Dissolution of Partnership and Dissolution of Firm (Concepts Only).				
Books for Study:				
1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi. 3. S. Thothadri and S. Nafeesa, Financial Accounting, McGraw Hill Education, Chennai.				

Books for Reference:

1. **M.C.Shukla, T.S.Grewal, S.C. Gupta**, Advanced Accounts – Volume I, S.Chand& Co., - New Delhi.
2. **S.P. Jain and K.L.Narang**, Financial Accounting, Kalyani Publishers, Ludhiana.
3. **V.K.Goyal**, Financial Accounting, Excel Books, New Delhi.
5. **Mukherji & M. Hanif**, Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.

CLOs	Course Learning Outcomes <i>At the end of the Course, the students will be able to:</i>	Knowledge Level
CLO1	Summarize accounting transactions using Journal Entries, Ledger Accounts, Trial Balance and Final Accounts.	K2
CLO2	Explain Depreciation and prepare Depreciation Account.	K1
CLO3	Compare discrepancies in cash and bank account with BRS.	K2
CLO4	Discover Profit or Loss using Single Entry System.	K3
CLO5	Devise accounts relating to the admission and retirement of partner.	K4

Course Learning Outcomes	Program Specific Outcomes								
	PSO ₁	PSO ₂	PSO ₃	PSO ₄	PSO ₅	PSO ₆	PSO ₇	PSO ₈	
	CLO ₁	✓	✓	✓		✓	✓	✓	✓
	CLO ₂	✓	✓	✓	✓	✓		✓	
	CLO ₃	✓	✓	✓	✓	✓		✓	
	CLO ₄	✓	✓	✓		✓	✓	✓	
	CLO ₅	✓	✓	✓	✓	✓	✓		
	Mapping	5	5	5	3	5	3	4	1
	Number of Matches = 31/40 = 77.5% (Very High Correlation)								

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBSKB102	Skill Enhancement Course	Professional Communication for Commerce & Management	3	3
Course Objectives				
1. Educate students with the importance and scope of communication in Work-Life. 2. Teach the basic elements and conceptual knowledge of professional communication. 3. Impart the procedural knowledge of listening to process description and excellent presentation skills 4. Enlighten the meta-cognitive knowledge of digital trends in professional communication				
Unit-I	Introduction to Communication			9 Hours
Communication - Features - Need - Importance - Process - Principles - Modes - Types - Flow of Communication - Barriers to Communication.				
Unit-II	Professional Communication			9 Hours
Professional Communication - Features - Functions – Essentials - Kinds - Components - Layout - Common Errors - Communication Ethics – Professional Etiquettes.				
Unit-III	Description			9 Hours
Listening to Process Description – Drawing a Flow Chart – Role Play – Skimming and Scanning – Reading Passages on Products, Equipment and Gadgets –Process Description – Compare and Contrast Paragraph – Sentence Definition and Extended Definition – Free Writing.				
Unit-IV	Presentation Skills			9 Hours
Presentation – Developing Professional Presentation - Listening to Lectures – Short Talks – Reading Comprehension Passages – Writing Recommendations – Interpreting Visual Inputs – Register Specific – Incorporate into the LSRW Tasks.				
Unit-V	Digital Communication			9 Hours
Digital Communication – Features – Pros & Cons – Types – E-Mail Etiquettes - Collaborative Digital Workspaces - Unified Communications – Virtual Meeting – Intranet for Communications within Organisation - Mobile Applications.				
Books for Study:				
1. Thameemul Ansari S & Ragavan N, Business Communication, Shri Sai Publishers Distributors, Chennai. 2. Raghunathan & Santhanam, Business Communication, Margham Publications 3. English for Commerce and Management, Tamil Nadu State Council for Higher Education.				
Books for Reference:				
1. Bob Dignen, Communicating in Business English (with Audio CD) 2. Bryan A. Garner, HBR Guide to Better Business Writing (HBR Guide Series) 3. Ashutosh & Arindam, Professional Communication, S.Chand. 4. Sutapa Banerjee, Soft Skill: Business and Professional Communication (for BBA and MBA Students), I.K. International.				

E-Contents:

1. <https://courses.lumenlearning.com/wm-businesscommunicationmgrs/>
2. <https://open.lib.umn.edu/businesscommunication/>
3. https://www.tn.gov/content/dam/tn/education/ccte/bus/cte_std_business_communications.pdf
4. <https://edu.gcfglobal.org/en/business-communication/business-writing-essentials/1/>
5. <https://www.youtube.com/watch?v=SSgOiUNxIOA>

CLOs	Course Learning Outcomes <i>At the end of the Course, the students will be able to:</i>	Knowledge Level
CLO1	Explain the concept, features, process and principles of communication.	K1
CLO2	Illustrate the functions & kinds of Professional Communication, Communication ethics and Professional etiquettes.	K1
CLO3	Sketch Flow Chart and do Skimming and Scanning.	K3
CLO4	Use Short Talks and Draft Recommendations.	K3
CLO5	Summarize various forms of Digital Communication.	K2

Course Learning Outcomes	Program Specific Outcomes								
	PSO ₁	PSO ₂	PSO ₃	PSO ₄	PSO ₅	PSO ₆	PSO ₇	PSO ₈	
	CLO ₁	✓	✓	✓	✓				
	CLO ₂	✓	✓	✓	✓	✓			
	CLO ₃	✓	✓	✓	✓	✓	✓		
	CLO ₄	✓	✓	✓		✓	✓		
	CLO ₅	✓	✓	✓		✓	✓	✓	
	Mapping	5	5	5	3	4	3	3	1
	Number of Matches = 29/40 = 72.5% (High Correlation)								

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBBAAL11	ALLIED	BUSINESS STATISTICS	7	5
Instructional Objectives				
1. Impart the basic concepts of Business Statistics 2. Educate the Measures of Central Tendency & Measures of Variations 3. Teach the application of Correlation & Regression Analyses 4. Impart the knowledge of Time Series and Index Series				
Unit-I	INTRODUCTION TO STATISTICS			20 Hours
Statistics – Definition – Functions – Scope of Statistics – Limitations – Collection of Data – Presentation – Classification – Types – Tabulation – Charting Data – Diagrams – Types – Graphs – Limitations.				
Unit-II	CENTRAL TENDENCY & MEASURES OF VARIATIONS			25 Hours
Measures of Central Tendency – Objectives – Characteristics – Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean. Measures of Variations – Range – Quartile Deviation – The Mean Deviation –The Standard Deviation – Correcting incorrect values of Mean and Standard Deviation. Coefficient of Skewness – Karl-Pearson’s – Bowley’s – Kelly’s Methods.				
Unit-III	CORRELATION & REGRESSION ANALYSES			20 Hours
Karl Pearson’s Co-efficient of Correlation – Spearman’s Rank Correlation Co-efficient – Concurrent Deviation. Simple Regression Analysis – Regression Co-efficient.				
Unit-IV	TIME SERIES			20 Hours
Analysis of Time Series – Components – Methods of Measuring Trends – Semi-average – Moving-average Methods – Method of Least Squares – Seasonal Variations.				
Unit-V	INDEX NUMBERS			20 Hours
Index Numbers – Uses and Limitations – Classification – Methods of Constructing Index Numbers – Unweighted – Weighted – Tests for Perfection – Time Reversal Test - Factor Reversal Test – Consumer Price Index Number – Cost of Living Index Number				

BBA SYLLABI 2022-23				
II SEMESTER				
Course Code	COURSE	COURSE TITLE	L	C
UBBA2001	CORE	BUSINESS ENVIRONMENT	5	4
Instructional Objectives				
1. Teach the basic elements of Business Environment that students must be aware of. 2. Educate the conceptual knowledge of Political Environment that students must be familiar with. 3. Impart the procedural knowledge of Social Environment that students must be accustomed to. 4. Prepare the students with procedural knowledge of Financial Environment.				
UNIT I	INTRODUCTION		15 Hours	
The concept of Business Environment – its nature and significance – Brief overview of Political , Cultural, Legal, Economic and Social Environment and their impact on business and strategic decisions.				
UNIT II	POLITICAL ENVIRONMENT		15 Hours	
Government Policy towards Pollution Control – Government and Business relationship in India – Provisions of Indian constitution pertaining to business.				
UNIT III	SOCIAL ENVIRONMENT		15 Hours	
Cultural heritage – Social attitude – Impact of foreign culture, Caste and Communities – Joint Family System – Linguistic and Religious Groups – Types of Social Organization.				
UNIT IV	FINANCIAL ENVIRONMENT		15 Hours	
Commercial Banks – RBI –IDBI –Non-Banking Financial Companies (NBFC).				
UNIT V	RECENT DEVELOPMENTS		15 Hours	
Globalization –Features – Limitations - Essential Conditions for Globalization – Obstacles to Globalization – Foreign Direct Investment – Meaning – Merits & Disadvantages of FDI.				
Books for Study:				
1. Dr. C.D. Balaji – Business Environment, Margham Publications, Chennai. 2. Dr. Sankaran - Business Environment, Margham Publishers, 2012, Chennai 3. Dr.V.C.Sinha- Business Environment, SPBD Publishing House, Aagrah U.P.				
Books for Reference:				

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBBA2002	Discipline Specific Core Course	BUSINESS MANAGEMENT	4	3
Course Objectives				
1. Teach the concept and principles of Management. 2. Educate the conceptual knowledge of Planning and Organising. 3. Impart the knowledge of Directing and Coordinating 4. Instruct students regarding Controlling and Motivation.				
Unit-I	Introduction to Management			12 Hours
Management – Nature – Scope – Levels - Importance - Functions – Management as an Art, Science or Profession - Management vs Administration - Contributions of FW Taylor, Henry Fayol and Elton Mayo – Manager – Qualities of a successful Manager – The Management Process (POSDCORB). Activity 1: Prepare a power point presentation on Indian Management Experts				
Unit-II	Planning			12 Hours
Planning – Definition – Nature – Importance – Types - Steps – Objectives. Forecasting – Meaning – Purpose – Methods. Decision Making – Meaning – Process. Activity 2: Prepare Chart on Planning Process				
Unit-III	Organising			12 Hours
Organising – Nature – Purpose – Principles – Process – Organization Structure – Committees - Chain of Command – Authority, Responsibility & Accountability – Centralization vs Decentralisation of Authority – Span of Management. Activity 3: Role-play on formation of committees				
Unit-IV	Directing & Coordinating			12 Hours
Staffing – Functions – Directing – Nature – Principles and techniques of Directing. Co-ordination - Meaning – Importance - Techniques. Activity 4: Case study on coordination				
Unit-V	Controlling & Motivation			12 Hours
Controlling – Features – Steps - Techniques of Controlling – Budgetary and Non-Budgetary Control. Motivation – Nature – Process – Significance at workplace - Theories - Maslow’s – McGregor’s - McClelland. Activity 5: Industrial Visit: Visit a nearby industry to study the techniques of controlling				
Note: Activities to be considered only for Internal Assessment				
Books for Study:				
1. C.B. Gupta, Business Management Theory and Practice – Sultan Chand & Sons, New Delhi.				

2. **J. Jayasankar**, Principles of Management, Margham Publications, Chennai.
3. **P.C Tripathi & P.N.Reddy** -Principles of Management-Tata Mc.Graw Hill.

Books for Reference:

1. L.M. Prasad, Principles and Practice of Management, Sultan Chand & Sons, New Delhi.
2. Harold Koontz, Cyril O'Donnell, Principles of Management – An Analysis of Managerial Functions, International Student, New Delhi.
3. Peter Ferdinand Drucker, Management Cases, Harper and Row Publishers, New York.
4. Sharma & Shashi K Gupta – Principles of Management-Kalyani publishing House, New Delhi.

CLOs	Course Learning Outcomes <i>At the end of the Course, the students will be able to:</i>	Knowledge Level
CLO1	Explain the principles of Management	K1
CLO2	Classify the steps in Planning and Organizing	K2
CLO3	Summarize the principles and techniques of Directing	K2
CLO4	Describe the features of Controlling and Coordinating	K1
CLO5	Relate the various Motivational Theories	K3

Course Learning Outcomes	Program Specific Outcomes							
	PSO ₁	PSO ₂	PSO ₃	PSO ₄	PSO ₅	PSO ₆	PSO ₇	PSO ₈
	CLO ₁	✓	✓			✓		
	CLO ₂	✓	✓	✓	✓	✓	✓	✓
	CLO ₃	✓	✓	✓	✓	✓	✓	✓
	CLO ₄	✓	✓	✓	✓	✓	✓	
	CLO ₅	✓	✓	✓	✓	✓		✓
	Mapping	5	5	4	3	4	4	3
	Number of Matches = 31/40 = 77.5% (Very High Correlation)							

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBBAAL21	ALLIED	OPERATIONS RESEARCH	4	4
Course Objectives				
1. Impart the basic concepts of Operations Research 2. Educate the methods of solving Transportation and Assignment problems 3. Teach the application of Sequencing & Replacement Problems 4. Explain about the uses and applications of Networking Problems				
Unit-I	INTRODUCTION TO OR & TRANSPORTATION PROBLEM			15 Hours
Operations Research – Models – Applications – Scope – Merits – Demerits.				
Transportation Problems – Initial Basic Feasible Solutions – Methods – NWC – LCM – VAM - Balanced – Unbalanced - Degeneracy – Optimal Solution – MODI Method - Minimization of Cost – Maximization of Profit – Simple Problems.				
Unit-II	ASSIGNMENT PROBLEMS			15 Hours
Assignment Problems - Balanced – Unbalanced – Hungarian Method – Optimal Solution – Minimization– Assignment of Jobs – Maximization – Travelling Salesman – Restrictions in Assignments - Simple Problems.				
Unit-III	SEQUENCING PROBLEMS			10 Hours
Sequencing/ Scheduling Methods – Assumptions - Processing ‘n’ Jobs – Two Machines – Three Machines – K Machines – Simple Problems.				
Unit-IV	REPLACEMENT PROBLEMS			10 Hours
Maintenance & Replacement – Models/ Techniques –Situations – Replacement Policy - Replacement of Parts – Simple Problems.				
Unit-V	NETWORKING			10 Hours
Networking Methods - Critical Path Method (CPM) – Program Evaluation Review Technique (PERT) – Basic differences between PERT & CPM – Construction of Network Diagrams – Rules – Simple Problems.				

II SEMESTER				
Course Code	Course	Course Title	L	C
UBBAAL22	ALLIED	CONSUMER BEHAVIOUR	4	3
Instructional Objectives				
1. Teach the scope and application of consumer behaviour 2. Impart the various models of consumer behaviour 3. Explain the major internal factors influencing consumer behaviour 4. Educate social and ethical implications on consumer behaviour				
Unit-I	INTRODUCTION		10 Hours	
Meaning – Definition – characteristics of consumer behaviour– Scope of consumer behaviour – Need for studying Consumer Behaviour - Stages in the development of consumer behaviour – Buying Motives- Types of buying motives.				
Unit-II	CONSUMER BEHAVIOR MODELS		15 Hours	
Industrial and Individual Consumer Behaviour Models – Economic model, Learning model, Psychoanalytic model and Sociological model- Howard – Kollat, Webster and Wind model – Implications of the Models on Marketing Decisions.				
Unit-III	INTERNAL & EXTERNAL INFLUENCES		15 Hours	
Psychological Influences on Consumer Behaviour – Motivation – Learning and Attitude - Self Image and Life styles – Consumer expectation and satisfaction - Socio-Cultural, Cross Culture - Family group – Reference group – Communication.				
Unit-IV	PURCHASE DECISION PROCESS and POST PURCHASE BEHAVIOUR		10 Hours	
Consumer Involvement - Types of Involvement – Distinguish between High and Low Involvement Decision Making- levels of consumer involvement- Factors influencing consumer involvement- Post-purchase Behaviour and its process.				
Unit-V	ONLINE MARKETING		10 Hours	
Online Channels – Types – Online Marketing – Meaning – Definition – Characteristics of online marketing – Advantages and disadvantages of online marketing– Challenges of Online Marketing.				
Books for Study:				
1. Dr. L. Natarajan, Consumer Behaviour, Margham Publication. 2. Ramanuj Majumdar - Consumer Behaviour 3. S. H. H. Kazmi - Consumer Behaviour				

Books for Reference:

1. Leon & Kumar – Consumer Behavior, Pearson, 2015
2. Hawkins et. al., Consumer Behavior: Building Marketing Strategy, Mc Graw, 2017
3. Vishwajeet Prasad – Consumer Behaviour , Gen Next Publications
4. Sangeeta sahney – Consumer Behaviour, Oxford Publishers

CLOs	Course Learning Outcomes <i>At the end of the Course, the students will be able to:</i>	Knowledge Level
CLO1	Describe the scope and application of consumer behaviour	K1
CLO2	Categorize the various models of consumer behaviour	K4
CLO3	Articulate the major internal factors influencing consumer behaviour	K3
CLO4	Cite social and ethical implications on consumer behaviour	K2
CLO5	Recognize the Opportunities & Threats of Online Marketing	K1

Course Learning Outcomes	Program Specific Outcomes								
	PSO ₁	PSO ₂	PSO ₃	PSO ₄	PSO ₅	PSO ₆	PSO ₇	PSO ₈	
	CLO ₁	✓	✓			✓			
	CLO ₂	✓	✓	✓	✓	✓	✓	✓	
	CLO ₃	✓	✓	✓	✓	✓	✓	✓	
	CLO ₄	✓	✓	✓	✓	✓	✓	✓	
	CLO ₅	✓	✓		✓	✓		✓	
	Mapping	5	5	3	4	5	3	3	4
	Number of Matches = 32/40 = 80% (Very High Correlation)								

**B.Com. COMPUTER
APPLICATIONS**

Programme Outcome (POs) for B.Com. (Computer Applications)

PO1: Communicate ideas, thoughts & knowledge through English effectively with individuals, groups, and businesses using Verbal, Non-Verbal, and Digital modes of Communication. Develop linguistic skills in one Indian/Regional language.

PO2: Demonstrate knowledge of the concepts, principles, theories, and techniques related to various forms, facets, and functions of Business.

PO3 Synthesize learned knowledge and acquired skills to establish, organize, manage and/or develop a business/organisation effectively and efficiently in the capacity of an entrepreneur, businessman, or any other professional.

PO4 Critically evaluate a problem/environment and take informed business decisions to solve problems.

PO5 Exhibit potential to accomplish tasks independently or as a member or leader of a team.

PO6 Use Computers, Software, Internet, and other ICT tools to maximize resource utilization and increase efficiency in day-to-day business operations.

PO7 Plan, Executes, and Manages a Project after careful appraisal.

PO8 Develop products, Frame Policies, and/or collaborate to help Society in increasing the living standards and towards building a Sustainable Environment.

PO9 Discover a passion for Lifelong Learning through MOOCs, ODL, and Self-Learning techniques through optimum use of ICT.

PO10 Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and

Personal spheres of life, caring for the underprivileged, leading to a better sustainable future.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

By the end of the Programme, the Students will be able to

PSO1: Understand the principles of Communication, Business Management and able to apply them in business contexts.

PSO2: Prepare Accounts of Various types of business entities in digital format.

PSO3: Draft proforma of Various Statements and Reports of Joint Stock Companies, Banking Companies using computer applications.

PSO4: Collect, Tabulate, Analyse and interpret data using Statistical Tools and Software.

PSO5: Create and Manage data base for different types of organisations.

PSO6: Conduct business by adhering to various Legal and Regulatory Guidelines in the digital era.

PSO7: Exhibit Entrepreneurship Skills.

PSO8: Apply Optimal Costing Methods for better decision making.

PSO9: Apply Income Tax Provision to estimate Tax Liability of Individuals and MSMEs.

PSO10: Perform Business Activities efficiently and effectively in the digital Era with the help of ICT.

Program Specific Outcomes PSOs	Program Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO2	✓	✓	✓	✓		✓			✓	
PSO3	✓	✓		✓		✓				
PSO4	✓	✓		✓		✓	✓		✓	
PSO5	✓	✓	✓	✓		✓				
PSO6	✓	✓						✓		✓
PSO7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO8	✓			✓		✓	✓	✓		
PSO9	✓	✓	✓	✓		✓		✓		
PSO10	✓	✓	✓	✓	✓	✓	✓		✓	
Number of Matches = 64 , Correlation: High										

Mapping Bench Mark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-30	31-60	61-70	71-100
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCA1001	Discipline Specific Core Course	FINANCIAL ACCOUNTING I	7	6
Course Objectives				
5. To enlighten the students with various Concepts of Accounting. 6. To impart knowledge of Accounting Principles & Conventions. 7. To make the students compute Average Due Date and Insurance Claims 8. To impart practical knowledge in the Preparation of Accounts under Single Entry System 9. To familiarise students with the preparation of Partnership Account.				
Unit-I	Accounting Framework			21 Hours
Conceptual Framework: Accounting Principles - Accounting Concepts - Accounting Conventions – Introduction to AS, Ind-AS & IFRS – Accounting Process: Journal – Ledger – Trial Balance – Meaning and Types of Accounting Errors. Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Adjustments in Final Accounts: Outstanding Expenses – Prepaid Expenses – Accrued Income - Income Received in Advance - Depreciation and Appreciation of Fixed Assets – Interest on Capital – Interest on Drawings.				
Unit-II	Depreciation Accounting & BRS			21 Hours
Depreciation – Causes – Methods of providing Depreciation – Straight Line Method – Diminishing Balance Method – Annuity Method – Sinking Fund Method (Simple Problems only). Bank Reconciliation Statement – Meaning – Need – Preparation of Bank Reconciliation Statement.				
Unit-III	Average Due Date and Fire Insurance Claims			21 Hours
Average Due Date – Determination of Due Date – Calculation of Interest. Meaning of Fire Insurance – Need for Fire Insurance – Computation of Claims to be lodged for loss of stock – Average Clause.				
Unit-IV	Single Entry System			21 Hours
Single Entry System – Objectives – Features – Limitations – Differences between Single Entry and Double Entry System – Ascertainment of Profits through Net worth Method (Statement of Affairs) and Conversion Method.				
Unit-V	Partnership Accounts			21 Hours
Partnership – Features – Types of Partners - Admission of a Partner – Retirement of a Partner - Calculation of New Ratio, Sacrificing Ratio & Gaining Ratio – Calculation of Goodwill – Preparation of Revaluation Account, Capital Account and Balance Sheet at the time of Admission				

and Retirement. Dissolution - Meaning – Modes - Dissolution of Partnership and Dissolution of Firm (Concepts Only).
Books for Study: 1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi. 3. S. Thothadri and S. Nafeesa, Financial Accounting, McGraw Hill Education, Chennai.
Books for Reference: 1. M.C.Shukla, T.S.Grewal, S.C. Gupta, Advanced Accounts – Volume I, S.Chand & Co., - New Delhi. 2. S.P. Jain and K.L.Narang, Financial Accounting, Kalyani Publishers, Ludhiana. 3. V.K.Goyal, Financial Accounting, Excel Books, New Delhi. 4. S.M. Shukla, Financial Accounting, Sahitya Bhawan Publications, Agra. 5. Mukherji & M. Hanif, Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.
Course Learning Outcomes CLO1: Pass Journal Entries, Prepare Ledger Accounts, Trial Balance and Final Accounts. CLO2: Compute Depreciation and Prepare Depreciation Account. CLO3: Prepare Bank Reconciliation Statement. CLO4: Calculate Average Due Date. CLO5: Compute Fire Insurance Claims. CLO6: Prepare Statement of Affairs and Statement of Profit or Loss in Single EntrySystem. CLO7: Prepare Revaluation Account, Capital Account and Balance Sheet while admission and retirement of a partner.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Pass Journal Entries, Prepare Ledger Accounts, Trial Balance and Final Accounts.	K1, K2, K3, K4,K5, K6
CO2	Compute Depreciation and Prepare Depreciation Account.	K2, K3, K4,
CO3	Prepare Bank Reconciliation Statement.	K2, K3, K4,K6
CO4	Calculate Average Due Date.	K2, K4,K5
CO5	Compute Fire Insurance Claims.	K1, K3, K4, K5
CO6	Prepare Statement of Affairs and Statement of Profit or Loss in Single EntrySystem.	K1, K3, K4
CO7	Prepare Revaluation Account, Capital Account and Balance Sheet while admission and retirement of a partner.	K1, K3, K4
K1- Remembering / Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

MAPING WITH COURSE LEARNING OUTCOMES (CLOs) and PROGRAMME LEARNING OUTCOMES (PLOs)

Course Outcomes (CSOs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	✓	✓	✓	✓	✓	✓	✓			✓
CO2	✓	✓	✓	✓	✓	✓	✓			✓
CO3	✓	✓	✓	✓	✓	✓	✓			✓
CO4	✓	✓	✓	✓	✓	✓	✓			✓
CO5	✓	✓	✓	✓	✓	✓	✓			✓
CO6	✓	✓	✓	✓	✓	✓	✓			✓
CO7	✓	✓	✓	✓	✓	✓	✓			✓
	Number of Matches = 56, Correlation: Very High									

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-20	21-42	43-53	54-70
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBSKB102	Skill Enhancement Course	Professional Communication for Commerce & Management	3	3
Course Objectives:				
1. To teach the basic elements and conceptual knowledge of professional communication. 2. To impart the procedural knowledge of listening to process description and excellent presentation skills 3. To enlighten the meta cognitive knowledge of digital trends in professional communication.				
Unit-I	Introduction to Communication			9 Hours
Communication - Features - Need - Importance - Process - Principles - Modes - Types - Flow of Communication - Barriers to Communication.				
Unit-II	Professional Communication			9 Hours
Professional Communication - Features - Functions – Essentials - Kinds - Components - Layout - Common Errors - Communication Ethics – Professional Etiquettes.				
Unit-III	Description			9 Hours
Listening to Process Description – Drawing a Flow Chart – Role Play – Skimming and Scanning – Reading Passages on Products, Equipment and Gadgets –Process Description – Compare and Contrast Paragraph – Sentence Definition and Extended Definition – Free Writing.				
Unit-IV	Presentation Skills			9 Hours
Presentation – Developing Professional Presentation - Listening to Lectures – Short Talks – Reading Comprehension Passages – Writing Recommendations – Interpreting Visual Inputs – Register Specific – Incorporate into the LSRW Tasks.				
Unit-V	Digital Communication			9 Hours
Digital Communication – Features – Pros & Cons – Types – E-Mail Etiquettes - Collaborative Digital Workspaces - Unified Communications – Virtual Meeting – Intranet for Communications within Organisation - Mobile Applications.				
Books for Study:				
1. Thameemul Ansari S & Ragavan N, Business Communication, Shri Sai Publishers’ Distributors, Chennai. 2. Raghunathan & Santhanam, Business Communication, Margham Publications 3. 3. English for Commerce and Management, Tamil Nadu State Council for Higher Education.				
Books for Reference:				
1. Bob Dignen, Communicating in Business English (with Audio CD) 2. Bryan A. Garner, HBR Guide to Better Business Writing (HBR Guide Series)				
E-Contents:				
6. https://courses.lumenlearning.com/wm-businesscommunicationmgrs/ 7. https://open.lib.umn.edu/businesscommunication/ 8. https://www.tn.gov/content/dam/tn/education/cccte/bus/cte_std_business_communications.pdf				

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-15	16-30	31-40	41-50
Correlation	Poor	Moderate	High	Very High

SEMESTER – I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCAAL11	Other Elective Course	Allied - Information Technology for Business – (Theory)	7	5
COURSE OBJECTIVES: 1. To make the students recognise basic features of computers. 2. To make the students recognize basic Computer Hardware and Peripherals 3. To make the students able to classify Computer Soft ware’s and their Applications. 4. To make the students appraise various operating System. 5. To teach the students how to distinguish between Internet and Intranet Networks. 6. To develop proficiency in using data, information technology in Business.				
UNIT-I	AN OVERVIEW OF COMPUTER		21 Hours	
Introduction to Computer – Meaning – Brief History of Computers, Computer System Concept –Characteristics – Capabilities and Limitations – Classification of Computers – Applications and Uses of Computers in Different Fields.				
UNIT-II	COMPUTER HARDWARE & PERIPHERALS		21 Hours	
Computer Hardware: Meaning – Basic Components of Computer System – Control Units – ALU – Input / Output Device , Input / Output & Storage Unit: Keyboard ,Mouse, Trackball , Joystick , Digitizing Table , Scanner , Digital Camera , MICR , OCR , OMR ,QR Code , Bar Code , Reader, Voice Recognition , Light Pen , Touch Screen , Monitors Characteristics And Types Of Monitors. Computer PERIPHERALS: Printer And Its Types – Input And Non input Printer – Storage Fundamentals – Memory RAM, ROM , EPROM , PROM And Other Types of Memory Primary VS Secondary Data Storage – Various Storage Devices.				
UNIT-III	SOFTWARE AND OPERATING SYSTEM		21 Hours	
Computer Software: Meaning – Needs – Types Of Software – System Software - Application Software Operating Systems: Introduction – Meaning – Functions- Classification Of Operating System – Version Of windows. Operating System – Features of Windows 7 & 10.				
UNIT-IV	COMPUTER NETWORK AND INTERNET		21 Hours	
Computer Network: Introduction – Types Of Computer Network – LAN ,WAN,MAN,VAN,SAN Various Topologies – Bus , Star , Ring , Mesh , Tree Network. Internet: Meaning – Concept of Internet , Intranet & Extranet , IP Address (Internet – Protocols – TCP/IP , UDP , FPB , TELNET , (Brief Ideas Only).				

UNIT-V	INFORMATION TECHNOLOGY AND BUSINESS	21 Hours
Concept Of Data , Information and Computer Based Information System , Impact of Information Technology In Business – IT And BPO – Benefits of BPO – BPO And IT Services – BPO Business Model – Meaning Of KPO – KPO vs. BPO – KPO Opportunity And Scope.		
Books for Study: 1. Fundamentals of Information Technology: Alexis Leon and Mathews Leon, Vikas Publishing House – 2000. 2. Information Technology Applications for Business: Dr. S. Sudalaimuthu, Himalaya Publications. 3. Computer Fundamentals: Anitha Goel, Pearson Publication 4. PC Software under Windows: Puneet Kumar, Kalyani Publications 5. MS Office 2000: Sanjay Saxsena, Vikas Publishing House, 2000.		
Books for Reference : 1. Introduction to Information Technology: Turban, E, R.K. Rainner Jr., and R. E. Potter, New Delhi: John Wiley – 2000. 2. Introduction to computer: Peter Norton, McGraw Hill 3. Fundamentals of Information technology: D. NVN Chary, Kalyani Publications 4. Information Technology for Management: Henry c. Lucas, McGraw Hill/Irwin 5. Introduction to Information Technology: V. Rajaraman, Prentice Hall of India, 2003		
Course Learning Outcomes (CLO's): By the end of the course, the students will be able to CLO1: Recognise basic features of Computers. CLO2: Categories the parts of Computer and their functioning. CLO3: Classify Computer Software & Operating System CLO4: Appraise Internet and Computer Network. CLO5: Use data, Information Technology in Business. CLO6: Contrast between KPO and BPO.		

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Recognise basic features of Computers.	K1, K2, K4,K5, K6
CO2	Categories the parts of Computer and their functioning.	K2, K3, K4,
CO3	Classify Computer Software & Operating System	K2, K3, K4,K6
CO4	Appraise Internet and Computer Network.	K2, K4,K5
CO5	Use data, Information Technology in Business.	K1, K3, K4, K5
CO6	Contrast between KPO and BPO.	K2, K3, K4, K5,K6
K1- Remembering / Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

MAPING WITH COURSE LEARNING OUTCOMES (CLOs) and PROGRAMME LEARNING OUTCOMES (PLOs)

Course Outcome s (CSOs)	Programme Specific Outcomes (PSOs)									
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO1 0
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓		✓		✓		✓			✓
CO3	✓			✓	✓		✓			✓
CO4	✓		✓	✓	✓		✓			✓
CO5	✓		✓	✓	✓		✓			✓
CO6	✓	✓	✓		✓	✓	✓			✓
	Number of Matches = 39 , Correlation: High									

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-18	19-36	37-45	46-60
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCA2001	Discipline Specific Core Course	FINANCIAL ACCOUNTING II	5	4
Course Objectives				
1. To enlighten the students with various Concepts in Accounting.				
2. To impart theoretical framework of Functional Accounting.				
3. To impart practical knowledge in the Preparation of Accounts.				
Unit-I	Branch Accounting			15 Hours
Branch - Types – Branch Accounting – Objectives - Accounting for Dependent Branches – Debtors System – Stock and Debtors System – Final Account System.				
Unit-II	Departmental Accounting			15 Hours
Department - Distinction between Departments and Branches – Allocation of Common Expenses – Expenses which cannot be allocated – Preparation of Departmental Accounts – Inter Departmental Transfers at cost price. (Simple Problems only).				
Unit-III	Hire Purchase System			15 Hours
Hire Purchase System – Features – Accounting Treatment in Hire Purchase System – Calculation of Interest – Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire Vendor – Meaning of Default and Repossession.				
Unit-IV	Instalment Purchase System			15 Hours
Instalment Purchase System – Features – Distinction between Hire Purchase and Instalment Purchase System – Accounting Treatment in Instalment Purchase System.				
Unit-V	Accounting for Non Profit Organizations			15 Hours
Preparation of Receipts and Payments Account – Preparation of Income and Expenditure Account. (Simple Problems only).				
Books for Study:				
1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai.				
2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi.				
3. S. Thothadri and S. Nafeesa, Financial Accounting, McGraw Hill Education, Chennai.				
Books for Reference:				
1. M.C.Shukla, T.S.Grewal, S.C. Gupta, Advanced Accounts – Volume I, S.Chand& Co., - New Delhi.				
2. S.P. Jain and K.L.Narang, Financial Accounting, Kalyani Publishers, Ludhiana.				
3. V.K.Goyal, Financial Accounting, Excel Books, New Delhi.				
4. S.M. Shukla, Financial Accounting, Sahitya Bhawan Publications, Agra.				
5. Mukherji & M. Hanif, Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.				
Course Learning Outcomes				
CLO1: Prepare Branch Account.				
CLO2: Compute Departmental Profit & Loss A/c.				
CLO3: Pass Journal Entries, prepare Ledger Accounts in the books of Hire Purchaser & Hire				

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-18	19-36	37-45	46-60
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCA2002	Discipline Specific Core Course	BUSINESS MANAGEMENT	4	3
Course Objectives				
1. Enlighten the students on the concept and principles of Management. 2. Educate the conceptual knowledge of Planning and Organising. 3. Impart the knowledge of Directing, Controlling and Motivation.				
Unit-I	Introduction to Management		12 Hours	
Management – Nature – Scope – Levels - Importance - Functions – Management as an Art, Science or Profession - Management vs Administration - Contributions of FW Taylor, Henry Fayol and Elton Mayo – Manager – Qualities of a successful Manager – The Management Process (POSDCORB). Activity 1: Prepare a power point presentation on Indian management Experts				
Unit-II	Planning		12 Hours	
Planning – Definition – Nature – Importance – Types - Steps – Objectives. Forecasting – Meaning – Purpose – Methods. Decision Making – Meaning – Process. Activity 2: Prepare Chart on Planning Process				
Unit-III	Organising		12 Hours	
Organising – Nature – Purpose – Principles – Process – Organization Structure – Committees - Chain of Command – Authority, Responsibility & Accountability – Centralization vs Decentralisation of Authority – Span of Management. Activity 3: Roleplay on formation of committees				
Unit-IV	Directing & Coordinating		12 Hours	
Staffing – Functions – Directing – Nature – Principles and techniques of Directing. Coordination - Meaning – Importance - Techniques. Activity 4: Case study on coordination				
Unit-V	Controlling & Motivation		12 Hours	
Controlling – Features – Steps - Techniques of Controlling – Budgetary and Non-Budgetary Control. Motivation – Nature – Process – Significance at workplace - Theories - Maslow’s – McGregor’s - McClelland. Activity 5: Industrial Visit: Visit a nearby industry to study the techniques of controlling				
Books for Study:				
4. C.B. Gupta, Business Management Theory and Practice – Sultan Chand & Sons, New Delhi. 5. J. Jayasankar, Principles of Management, Margham Publications, Chennai. 6. P.C Tripathi & P.N.Reddy -Principles of Management-Tata Mc.Graw Hill.				
Books for Reference:				

5. **L.M. Prasad**, Principles and Practice of Management, Sultan Chand & Sons, New Delhi.
6. **Harold Koontz**, Cyril O'Donnell, Principles of Management – An Analysis of Managerial Functions, International Student, New Delhi.
7. **Peter Ferdinand Drucker**, Management Cases, Harper and Row Publishers, New York.
8. **Sharma & Shashi K Gupta** – Principles of Management-Kalyani publishing House, New Delhi.
9. **Stephen P. Robbins et.al.**, Fundamentals of Management, Pearson

Course Learning Outcomes:

CLO1: Explain the principles of Management.

CLO2: Enumerate the steps in Planning.

CLO3: Apply principles and techniques of Directing

CLO4: Describe the features of Controlling

CLO5: Discuss various Motivation Theories.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explain the Principles of Management.	K1, K2,
CO2	Enumerate the steps in Planning.	K1,K2, K3,
CO3	Apply Principles and techniques of Directing	K2, K3, K4,K5,K6
CO4	Describe the features of Controlling	K1,K2
CO5	Discuss various Motivation Theories.	K1, K2, K5
K1- Remembering / Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

**MAPING WITH COURSE LEARNING OUTCOMES (CLOs) and
PROGRAMME LEARNING OUTCOMES (PLOs)**

Course Outcomes (CSOs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	✓					✓				✓
CO2	✓		✓		✓			✓		✓
CO3	✓				✓	✓	✓	✓		✓
CO4	✓		✓		✓			✓		✓
CO5	✓					✓			✓	✓
	Number of Matches = 23 ,					Correlation: Moderate				

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-15	16-30	31-40	41-50
Correlation	Poor	Moderate	High	Very High

SEMESTER – II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCAAL21	Allied Course	CONSUMER WELFARE	4	4
COURSE OBJECTIVES: 1. To Disseminate basic knowledge of Consumer Rights and Welfare. 2. To Enlighten the students above provisions of Consumer Protection Act. 3. To raise awareness on Consumer Dispute and Redressal Agencies 4. To appraise about consumer welfare measures.				
UNIT-I	INTRODUCTION TO CONSUMER AND MARKETS:		12 Hours	
Consumer – Meaning - Classification of Consumers – Customer – Meaning and Definition – Market - Definition of Market - Nature of Market - Consumer Behaviors – Factors affecting Consumer Behavior - Consumer Buying Process - Consumer Needs- Factors affecting Consumer needs- Consumer Welfare -Measures taken by Central & State Government towards consumer welfare.				
UNIT-II	CONSUMER PROTECTION LAW		12 Hours	
Consumer Welfare: Meaning and Definition – Needs of Consumer Welfare - Consumer Awareness - Benefits of Consumer Awareness-Consumer Protection Act, 2019 – Definition – Important Terms in Consumer Protection - Salient Features of the Consumer Protection Act 2019.				
UNIT-III	OTHER LAWS RELATED TO CONSUMER PROTECTION IN INDIA		12 Hours	
Competition Act 2002 – Meaning, Definitions and Features - Right to Information Act, 2005 - Meaning, Definitions and Features - RBI and Banking Ombudsman - IRDA and Insurance Ombudsman – FSSAI.				
UNIT-IV	CONSUMER DISPUTE REDRESSAL AGENCIES		12 Hours	
Consumer Dispute Redressal Agencies - National Commission –State Commission – District Forum – Procedure for Filing Complains with Redressal Agencies - Commodity, Goods and Services –Types of Goods and Services - Goods and Services cover under Consumer Protection Act.				

UNIT-V	CONSUMER WELFARE MEASURES	12 Hours
Consumer Welfare Measures taken by MNC's- Recent trends in consumer activism- Role of Supreme Court and High Courts in Consumer Welfare- Role of NGO's in Consumer Education - Case Laws		
Books for Study: 1. Consumer Awareness, Dr. R. Sivanesan, Margham Publications 2. Consumer Protection Act: A Commentary by G. B. Reddy and Baglekar Akash Kumar, EBC Reader 3. Consumer Protection Law by Saharay H K, Elsevier India 4. Competition Law by Neha Vyas, Eastern Book Company		
Books for Reference: 1. Consumer Protection (Amendment) Act, 2002. S.Chand & Sons. 2012 2. Consumer Behaviour, Rajan Nair, Sultan Chand & Sons. 2010 3. Consumer Protection Law by Saharay H K, Elsevier India		
Course Learning Outcomes (CLO's): By the end of the course, the students will be able to CO1: Appraise various aspects of Consumer Welfare. CO2: Define important terms under the provisions of Consumer Protection Act, 2019. CO3: Interpret important provisions of Competition Act 2002, RTI Act-2005. CO4: Describe the functions of Consumer Dispute Redressal Agencies. CO5: Illustrate Consumer Welfare measures NGOs, MNC and Supreme Court.		

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Appraise various aspects of Consumer Welfare.	K1, K2,
CO2	Define important terms under the provisions of Consumer Protection Act, 2019.	K1, K2, K3, K4
CO3	Interpret important provisions of Competition Act 2002, RTI Act-2005.	K1, K2, K3, K4, K5
CO4	Describe the functions of Consumer Dispute Redressal Agencies.	K1, K2,
CO5	Illustrate Consumer Welfare measures NGOs, MNC and Supreme Court.	K1, K2, K3, K4, K5
K1- Remembering / Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

MAPING WITH COURSE LEARNING OUTCOMES (CLOs) and PROGRAMME LEARNING OUTCOMES (PLOs)

Course Learning Outcomes (CLOs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CLO1	✓		✓		✓	✓	✓			✓
CLO2	✓	✓	✓	✓		✓	✓	✓		✓
CLO3	✓		✓		✓	✓	✓		✓	✓
CLO4	✓	✓	✓			✓	✓		✓	✓
CLO5	✓		✓		✓	✓	✓			✓
	Number of Matches = 34,					Correlation: High				

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-15	16-30	31-40	41-50
Correlation	Poor	Moderate	High	Very High

SEMESTER – II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCAAP21	Other Elective Course	Allied Lab - Information Technology for Business – (Practical)	4	3
COURSE OBJECTIVES: 1. To make the students know the basic components of computer and its supporting devices. 2. To familiarize with MS-Office and its application that the students can prepare text documents and PowerPoint for presentation. 3. To prepare students to create, edit and manipulate various types of document using MS-Office tools. 4. To train the students to design power-point presentations. 5. To familiarize the students to compose, send, forward and reply email and use internet browsers.				
UNIT-I	FUNDAMENTALS OF COMPUTER & OPERATING SYSTEM		21 Hours	
Fundamentals of Computer: Components of Digital Computer and Their functions – Input unit, Output Unit, Processing Unit and Storage Unit Operating System: Introduction to GUI based Operating system – Working with Windows 07,Creating a New Folder, Moving, Closing and Existing a Folder				
UNIT-II	OFFICE PACKAGES		21 Hours	
Office Packages: Office Activates and their Software requirements, Working with MS-Word, Menus & Tool bars & Buttons, Short Cut Menus MS-Word : Feature of Word Processor – Creating a new Documents, Different Page Views and Layout – Applying Various text Enhancements (Bold, Italic, underline, Cut, Copy and Paste Option) – Working with Style & Text Attributes (Fonts, Fonts Style, Size, Colour) – Working with Paragraph and Page Formatting –Bullets, Numbering, Text Alignment (Left, Right, Center, Justify)				
UNIT-III	WORD PROCESSING		21 Hours	
MS-Word: Advance features of MS-Word - Text Editing using various features – Find and Replace – Header and Footer – Inserting Page Numbers – Working with Column, Tabs and Indents – Inserting Table - Selecting Rows and Column sort the record by using Auto Format – Working with Page Layout – Margins, Orientation, Size.				
UNIT-IV	POWER-POINT PRESENTATION		21 Hours	
MS-Power Point: Features of MS-Power-Point Presentation – Elements of Presentation – Creating Presentation – Editing and Formatting Text on a Slide – Creating a Table, Adding Columns and rows in Slide - Inserting Charts and Drawing Objects – Inserting a Clip to your Slides using Word Art – Inserting Transition, Custom Show in a slides – Animating a Chart – Publish a Presentation – Showing and Running a Slide.				
UNIT-V	E-MAIL AND INTERNET BROWSING		21 Hours	
E-mail: Features of E-mail – Getting an E-Mail Account – Composing an email – Checking Inbox Internet Browsing – Access of Internet – Web Browser Software – Google Chrome, Internet Explorer, Mozilla Firefox - Open Search Engines – Google, Bing, Yahoo, Ask, Duck Duck Go				

Books for Study:

1. Fundamentals of Information Technology: Alexis Leon and Mathews Leon, Vikas Publishing House – 2000.
2. Information Technology Applications for Business: Dr. S. Sudalaimuthu, Himalaya Publications.
3. Computer Fundamentals: Anitha Goel, Pearson Publication
4. PC Software under Windows: Puneet Kumar, Kalyani Publications
5. MS Office 2000: Sanjay Saxsena, Vikas Publishing House, 2000.
6. Introduction to Information Technology, ITLESL, Pearson Publication.

Books for Reference :

1. Introduction to Information Technology: Turban, E, R.K. Rainer Jr., and R. E. Potter, New Delhi: John Wiley – 2000.
2. Introduction to computer: Peter Norton, McGraw Hill
3. Fundamentals of Information technology: D. NVN Chary, Kalyani Publications
4. Introduction to Information Technology: V. Rajaraman, Prentice Hall of India, 2003
5. Computer Today – S. K. Basandra, Galgotia Publications

Course Learning Outcomes (CLO's):

By the end of the course, the students will be able to

CLO1: Understand the Components of Digital Computer.

CLO2: Develop the skills of Creating, Saving documents using MS-Word.

CLO3: Format the Document and Insert the Table using MS- Word

CLO4: Use MS Office programs to create personal, academic and business documents

CLO5: Design Slides and Organisational charts using Ms Power Point.

CLO6: Demonstrate of Access of Internet.

CLO7: Create and send e-mail.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the Components of Digital Computer.	K1, K2,
CO2	Develop the skills of Creating, Saving documents using MS-Word.	K3,K4,K6
CO3	Format the Document and Insert the Table using MS- Word	K2,K3,K4,K6
CO4	Use MS Office programs to create personal, academic and business documents	K2,K3,K4,K5,K6
CO5	Design Slides and Organisational charts using Ms Power Point.	K1,K2,K3,K4,K6
CO6	Demonstrate of Access of Internet.	K1,K2,K3
CO7	Create and send e-mail.	K1,K2,K3,K4,K6
K1- Remembering / Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

MAPING WITH COURSE LEARNING OUTCOMES (CLOs) and PROGRAMME LEARNING OUTCOMES (PLOs)

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)									
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
CLO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO2	✓		✓			✓		✓		✓
CLO3	✓		✓	✓			✓		✓	✓
CLO4	✓		✓		✓		✓	✓		✓
CLO5	✓		✓	✓		✓		✓	✓	✓
CLO6	✓	✓	✓		✓	✓	✓		✓	✓
CLO7	✓			✓	✓		✓	✓		✓
	Number of Matches = 48 , Correlation: High									

Mapping Bench Mark

Mapping	1-30%	31-60%	61-75%	75-100%
Matches	1-20	21-42	43-53	54-70
Correlation	Poor	Moderate	High	Very High

**DEPARTMENT OF
B.Com. FINANCE & ACCOUNTS**

PROGRAMME OUTCOME FOR B.Com. (F&A)

PO1 Communicate ideas, thoughts & knowledge through English effectively with individuals, groups, and businesses using Verbal, Non-Verbal, and Digital modes of Communication. Develop linguistic skills in one Indian/Regional language.

PO2 Demonstrate knowledge of the concepts, principles, theories, and techniques related to various forms, facets, and functions of Business.

PO3 Synthesize learned knowledge and acquired skills to establish, organize, manage and/or develop a business/organisation effectively and efficiently in the capacity of an entrepreneur, businessman, or any other professional

PO4 Critically evaluate a problem/environment and take informed business decisions to solve problems

PO5 Exhibit potential to accomplish tasks independently or as a member or leader of a team

PO6 Use Computers, Software, Internet, and other ICT tools to maximize resource utilization and increase efficiency in day-to-day business operations

PO7 Plan, execute, and manage a Project after careful appraisal

PO8 Develop products, Frame Policies, and/or collaborate to help Society in increasing the living standards and towards building a Sustainable Environment

PO9 Discover a passion for Lifelong Learning through MOOCs, ODL, and Self-Learning techniques through optimum use of ICT.

PO10 Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

PSO: Program Specific Outcome

- PSO1** Acquire the knowledge of principles of commerce in the context of finance and accounts.
- PSO2** Understand the various accounting techniques and methods to adopt and practice these skills in various fields.
- PSO3** Develop the comprehension skills in the area of tax, and finance to become an expert, consultant for business firms.
- PSO4** Provide solutions for various economic issues in the field of agriculture, Industries, and other allied sectors
- PSO5** Understand the statistical methods and techniques to solve various problems relating to another interdisciplinary arena including research
- PSO6** Provide more exposure to modern aspects of HR and Marketing field so as to develop decision-making skills.
- PSO7** Entrepreneurial exposure to become young entrepreneurs and corporate professionals.
- PSO8** Equip with knowledge of legal framework in the context of the business, company, and various industries.
- PSO9** Understand the importance of communication, and writing necessary reports in the daily routine of business.
- PSO10** Computer applications and computerized accounting like e-filing and different tax return training will enable them to solve accounting problems.

Program Specific Outcomes PSOs	Program Out Comes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	√	√	√	√		√	√			√
PSO2	√	√	√	√	√	√	√			√
PSO3	√	√	√	√	√	√	√			
PSO4	√	√	√	√	√	√	√	√		√
PSO5	√	√	√	√	√	√	√			√
PSO6	√	√	√	√		√				√
PSO7	√	√	√	√	√	√	√	√		√
PSO8	√	√	√	√	√		√	√		√
PSO9	√	√	√	√		√		√	√	√
PSO10	√	√	√	√	√	√			√	√
Number of Matches 78, Correlation: Very high										

Mapping Bench Mark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-30	31-60	61-70	71-100
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBFA1001	Discipline Specific Core Course	FINANCIAL ACCOUNTING - I	7	6
Course Objectives				
1. To enlighten the students with various Concepts of Accounting. 2. To impart knowledge of Accounting Principles & Conventions. 3. To impart practical knowledge in the Preparation of Accounts				
Unit-I	Accounting Framework			21 Hours
Conceptual Framework: Accounting Principles - Accounting Concepts - Accounting Conventions – Introduction to AS, Ind-AS & IFRS – Accounting Process: Journal – Ledger – Trial Balance – Meaning and Types of Accounting Errors. Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Adjustments in Final Accounts: Outstanding Expenses – Prepaid Expenses – Accrued Income - Income Received in Advance - Depreciation and Appreciation of Fixed Assets – Interest on Capital – Interest on Drawings.				
Unit-II	Depreciation Accounting & BRS			21 Hours
Depreciation – Causes – Methods of providing Depreciation – Straight Line Method – Diminishing Balance Method – Annuity Method – Sinking Fund Method (Simple Problems only). Bank Reconciliation Statement – Meaning – Need – Preparation of Bank Reconciliation Statement.				
Unit-III	Average Due Date and Fire Insurance Claims			21 Hours
Average Due Date – Determination of Due Date – Calculation of Interest. Meaning of Fire Insurance – Need for Fire Insurance – Computation of Claims to be lodged for loss of stock – Average Clause.				
Unit-IV	Single Entry System			21 Hours
Single Entry System – Objectives – Features – Limitations – Differences between Single Entry and Double Entry System – Ascertainment of Profits through Net worth Method (Statement of Affairs) and Conversion Method.				
Unit-V	Partnership Accounts			21 Hours
Partnership – Features – Types of Partners - Admission of a Partner – Retirement of a Partner - Calculation of New Ratio, Sacrificing Ratio & Gaining Ratio – Calculation of Goodwill – Preparation of Revaluation Account, Capital Account and Balance Sheet at the time of Admission and Retirement. Dissolution - Meaning – Modes - Dissolution of Partnership and Dissolution of Firm (Concepts Only).				
Books for Study:				
1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi.				

3. **S. Thothadri and S. Nafeesa**, Financial Accounting, McGraw Hill Education, Chennai.

Books for Reference:

1. **M.C.Shukla, T.S.Grewal, S.C. Gupta**, Advanced Accounts – Volume I, S.Chand& Co., - New Delhi.
2. **S.P. Jain and K.L.Narang**, Financial Accounting, Kalyani Publishers, Ludhiana.
3. **V.K.Goyal**, Financial Accounting, Excel Books, New Delhi.
4. **S.M. Shukla**, Financial Accounting, Sahitya Bhawan Publications, Agra.
5. **Mukherji & M. Hanif**, Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.

Course Learning Outcomes

CLO1: Pass Journal Entries; Prepare Ledger Accounts, Trial Balance and Final Accounts.
 CLO2: Calculate Depreciation and Prepare Depreciation Account.
 CLO3: Prepare Bank Reconciliation Statement.
 CLO4: Calculate Average Due Date.
 CLO5: Compute Fire Insurance Claims.
 CLO6: Prepare Statement of Affairs and Statement of Profit or Loss in Single Entry System.
 CLO7: Prepare Revaluation Account, Capital Account and Balance Sheet while admission and retirement of a partner.

Website Sources:

1. <https://accountingonion.com/>
2. <https://www.journalofaccountancy.com/>
3. <https://www.accountingcoach.com/>
4. <https://due.com/blog/accounting-learnatorium-everything-you-need-to-know-to-be-a-better-accountant/>
5. <https://deardebtor.com/>

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Pass Journal Entries; Prepare Ledger Accounts, Trial Balance and Final Accounts.	K1, K2, K3, K4,K5, K6
CO2	Calculate Depreciation and Prepare Depreciation Account.	K2, K3, K4,
CO3	Prepare Bank Reconciliation Statement.	K2, K3, K4,K6
CO4	Calculate Average Due Date.	K2, K4,K5
CO5	Compute Fire Insurance Claims.	K1, K3, K4, K5
CO6	Prepare Statement of Affairs and Statement of Profit or Loss in Single Entry System	K2, K3, K4, K5,K6
CO7	Prepare Revaluation Account, Capital Account and Balance Sheet while admission and retirement of a partner.	K1, K3, K4
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBSKB102	Skill Enhancement Course	Professional Communication for Commerce & Management	3	3
Course Objectives				
1. To teach the basic elements and conceptual knowledge of professional communication. 2. To impart the procedural knowledge of listening to process description and excellent presentation skills 3. To enlighten the meta cognitive knowledge of digital trends in professional communication.				
Unit-I	Introduction to Communication			9 Hours
Communication - Features - Need - Importance - Process - Principles - Modes - Types - Flow of Communication - Barriers to Communication.				
Unit-II	Professional Communication			9 Hours
Professional Communication - Features - Functions – Essentials - Kinds - Components - Layout - Common Errors - Communication Ethics – Professional Etiquettes.				
Unit-III	Description			9 Hours
Listening to Process Description – Drawing a Flow Chart – Role Play – Skimming and Scanning – Reading Passages on Products, Equipment and Gadgets –Process Description – Compare and Contrast Paragraph – Sentence Definition and Extended Definition – Free Writing.				
Unit-IV	Presentation Skills			9 Hours
Presentation – Developing Professional Presentation - Listening to Lectures – Short Talks – Reading Comprehension Passages – Writing Recommendations – Interpreting Visual Inputs – Register Specific – Incorporate into the LSRW Tasks.				
Unit-V	Digital Communication			9 Hours
Digital Communication – Features – Pros & Cons – Types – E-Mail Etiquettes - Collaborative Digital Workspaces - Unified Communications – Virtual Meeting – Intranet for Communications within Organisation - Mobile Applications.				
Books for Study:				
1. Thameemul Ansari S & Ragavan N, Business Communication, Shri Sai Publishers' Distributors, Chennai. 2. Raghunathan & Santhanam, Business Communication, Margham Publications 3. English for Commerce and Management, Tamil Nadu State Council for Higher Education.				
Books for Reference:				
1. <u>Bob Dignen, Communicating in Business English (with Audio CD)</u> 2. <u>Bryan A. Garner, HBR Guide to Better Business Writing (HBR Guide Series)</u>				
E-Contents:				
1. https://courses.lumenlearning.com/wm-businesscommunicationmgrs/ 2. https://open.lib.umn.edu/businesscommunication/ 3. https://www.tn.gov/content/dam/tn/education/ccte/bus/cte_std_business_communications.pdf				

Course Code	Course Title	L	T	C
UBFAAL11	INDIAN ECONOMY	7	1	6
Instructional Objectives				
1. To understand the concept of growth and development, and factors influence the economic development of a nation. 2. To get enlightened various concepts of National Income and issues of poverty. 3. To assess the Indian planning system and new economic policy. 4. To gain knowledge of the agriculture and its contribution for economic growth. 5. To evaluate the industrial economy and its causes for sickness.				
Course Outcome:				
CO1	Understand the concept of growth and development, and factors influence the economic development of a nation.			
CO2	Get enlightened various concepts of National Income and issues of poverty.			
CO3	Assess the Indian planning system and new economic policy.			
CO4	Gain knowledge of the agriculture and its contribution for economic growth.			
CO5	Evaluate the industrial economy and its causes for sickness			
Unit-I	Economic Growth & Development	23 Hours		
Concepts and meaning of Growth and Development – Difference between Growth and Development - Features and Causes of Underdevelopment – Key Features of Emerging Economies - Determinants of Economic Development – Obstacles to Economic Development				
Unit-II	National Income & Poverty	21 Hours		
Basic Concepts of National Income GDP, GNP, NDP, NNP, Personal Income - Methods of Measuring National Income – Difficulties in the Measurement of National Income. Poverty: Absolute and Relative Poverty – Causes of Poverty – Poverty in India – Government measures for Poverty Alleviations				
Unit-III	Planning & New Economic Policy	21 Hours		
Planning in India– Meaning – Economic Planning – Types of Planning– Major objective of Five year Plans– Twelfth Five Plan- Niti Aayog - New Economic Policy and its impact on Indian Economy – Liberalization – Privatization – Globalization.				
Unit-IV	Agricultural Economy	20 Hours		
Agriculture – Role in Indian Economy (Contribution to Economic Growth) – Problems of Low Productivity – Land Reforms – Green Revolution.				
Unit-V	Industrial Economy	20 Hours		
Industry – Importance – Industrial policy in India-1948,1956 and 1991,Industrial development in India- Role of Large Scale Industries– Role of Small and Micro Enterprises – Industrial Sickness– Causes and Measures.				
Books for Study:				
1. I.C. Dhingra, Indian Economy, Sultan Chand & Sons, New Delhi-2019. 2. Dr.S. Sankaran, Indian Economy, Margham Publications, Chennai-2017. 3. Rudar Datt & Sundaram, Indian Economy, S. Chand & Co, New Delhi-2010. 4. Dhingra.I.C., Indian Economy, Sultan Chand & Sons, New Delhi-2015. 5. M. L. Jhingan, Economics of Development & Planning, Konark Publishers, New Delhi-2012.				
Books for Reference:				
1. General Economics. The Institute of Chartered Accountants of India. Latest revised edition 2. P.K. Dhar, Indian Economy – It’s Growing Dimension, 23 rd Edition, Kalyani Publisher-2015. 3. Ramesh Sing, Indian Economy, Civil service & competitive examination, 14 th edition, Tata McGraw Hill, New Delhi -.2022-2023. 4. Sankarganesh Karupiah, Indian Economy key Concepts, Sixth edition, Tata McGraw Hill,				

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBFA2001	Discipline Specific Core Course	FINANCIAL ACCOUNTING II	5	4
Course Objectives				
1. To enlighten the students with various Concepts in Accounting. 2. To impart theoretical framework of Functional Accounting. 3. To impart practical knowledge in the Preparation of Accounts.				
Unit-I	Branch Accounting			15 Hours
Branch - Types – Branch Accounting – Objectives - Accounting for Dependent Branches – Debtors System – Stock and Debtors System – Final Account System.				
Unit-II	Departmental Accounting			15 Hours
Department - Distinction between Departments and Branches – Allocation of Common Expenses – Expenses which cannot be allocated – Preparation of Departmental Accounts – Inter Departmental Transfers at cost price. (Simple Problems only).				
Unit-III	Hire Purchase System			15 Hours
Hire Purchase System – Features – Accounting Treatment in Hire Purchase System – Calculation of Interest – Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire Vendor – Meaning of Default and Repossession.				
Unit-IV	Instalment Purchase System			15 Hours
Instalment Purchase System – Features – Distinction between Hire Purchase and Instalment Purchase System – Accounting Treatment in Instalment Purchase System.				
Unit-V	Accounting for Non Profit Organizations			15 Hours
Preparation of Receipts and Payments Account – Preparation of Income and Expenditure Account. (Simple Problems only).				
Books for Study:				
1. T.S. Reddy and Murthy , Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy , Financial Accounting, Sultan Chand & Sons., New Delhi. 3. S. Thothadri and S. Nafeesa , Financial Accounting, McGraw Hill Education, Chennai.				
Books for Reference:				
1. M.C.Shukla, T.S.Grewal, S.C. Gupta , Advanced Accounts – Volume I, S.Chand& Co., - New Delhi. 2. S.P. Jain and K.L.Narang , Financial Accounting, Kalyani Publishers, Ludhiana. 3. V.K.Goyal , Financial Accounting, Excel Books, New Delhi. 4. S.M. Shukla , Financial Accounting, Sahitya Bhawan Publications, Agra. 5. Mukherji & M. Hanif , Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.				

CLO2: Prepare Departmental Trading and Profit & Loss A/c.

CLO3: Pass Journal Entries, prepare Ledger Accounts in the books of Hire Purchaser & Hire Vendor.

CLO4: Distinguish between Hire Purchase and Instalment Purchase System.

CLO5: Prepare Receipts and Payments Account for Non-Profit Organisations.

CLO6: Prepare Income and Expenditure Account for Non-Profit Organisations.

Website Sources:

1. <https://accountingonion.com/>
2. <https://www.journalofaccountancy.com/>
3. <https://www.accountingcoach.com/>
4. <https://due.com/blog/accounting-learnatorium-everything-you-need-to-know-to-be-a-better-accountant/>
5. <https://deardebt.com/>

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Prepare Branch Account.	K2, K3, K4,K5
CO2	Prepare Departmental Trading and Profit & Loss A/c.	K2, K3, K4, K5
CO3	Pass Journal Entries, prepare Ledger Accounts in the books of Hire Purchaser & Hire Vendor.	K2, K3, K4,K6
CO4	Distinguish between Hire Purchase and Instalment Purchase System.	K2, K4,K5
CO5	Prepare Receipts and Payments Account for Non-Profit Organisations.	K1, K3, K4, K5
CO6	Prepare Income and Expenditure Account for Non-Profit Organisations.	K2, K3, K4, K5,K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	✓	✓	✓	✓			✓	✓		✓
CO2	✓	✓	✓				✓	✓		✓
CO3	✓	✓	✓				✓	✓		✓
CO4	✓	✓	✓				✓	✓		✓
CO5	✓	✓	✓	✓			✓	✓	✓	✓
CO6	✓	✓	✓	✓			✓	✓	✓	✓
Number of Matches 41, Correlation: High										

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBFA2002	Discipline Specific Core Course	BUSINESS MANAGEMENT	4	3
Course Objectives				
1. Teach the concept and principles of Management. 2. Educate the conceptual knowledge of Planning and Organising. 3. Impart the knowledge of Directing, Controlling and Motivation.				
Unit-I	Introduction to Management			12 Hours
Management – Nature – Scope – Levels - Importance - Functions – Management as an Art, Science or Profession - Management vs Administration - Contributions of FW Taylor, Henry Fayol and Elton Mayo – Manager – Qualities of a successful Manager – The Management Process (POSDCORB). Activity 1: Prepare a power point presentation on Indian management Experts				
Unit-II	Planning			12 Hours
Planning – Definition – Nature – Importance – Types - Steps – Objectives. Forecasting – Meaning – Purpose – Methods. Decision Making – Meaning – Process. Activity 2: Prepare Chart on Planning Process				
Unit-III	Organising			12 Hours
Organising – Nature – Purpose – Principles – Process – Organization Structure – Committees - Chain of Command – Authority, Responsibility & Accountability – Centralization vs Decentralisation of Authority – Span of Management. Activity 3: Role play on formation of committees				
Unit-IV	Directing & Coordinating			12 Hours
Staffing – Functions – Directing – Nature – Principles and techniques of Directing. Co-ordination - Meaning – Importance - Techniques. Activity 4: Case study on coordination				
Unit-V	Controlling & Motivation			12 Hours
Controlling – Features – Steps - Techniques of Controlling – Budgetary and Non-Budgetary Control. Motivation – Nature – Process – Significance at workplace - Theories - Maslow’s – McGregor’s - McClelland. Activity 5: Industrial Visit: Visit a nearby industry to study the techniques of controlling				
Note: Activities to be considered only for Internal Assessment				
Books for Study: 1. C.B. Gupta, Business Management Theory and Practice – Sultan Chand & Sons, New Delhi. 2. J. Jayasankar, Principles of Management, Margham Publications, Chennai. 3. P.C Tripathi & P.N.Reddy -Priciples of Management-Tata Mc.Graw Hill.				
Books for Reference: 1. M. Prasad, Principles and Practice of Management, Sultan Chand & Sons, New Delhi. 2. Harold Koontz, Cyril O'Donnell, Principles of Management – An Analysis of Managerial Functions, International Student, New Delhi.				

3. **Peter Ferdinand Drucker**, Management Cases, Harper and Row Publishers, New York.
4. **Sharma & Shashi K Gupta** – Principles of Management-Kalyani publishing House, New Delhi.
5. **Stephen P. Robbins et.al.**, Fundamentals of Management, Pearson

Course Learning Outcomes

CLO1: Explain the principles of Management.

CLO2: Enumerate the steps in Planning.

CLO3: Gain understanding principles and techniques of Directing

CLO4: Describe the features of Controlling

CLO5: Discuss various Motivation Theories.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explain the principles of Management	K1, K2, K3
CO2	Enumerate the steps in Planning	K1, K2, K3
CO3	Gain understanding principles and techniques of Directing	K1, K2, K3
CO4	Describe the features of Controlling	K1, K2
CO5	Discuss various Motivation Theories	K1, K2, K3
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	✓		✓	✓	✓	✓	✓	✓		
CO2	✓		✓	✓		✓	✓	✓		
CO3	✓		✓	✓		✓	✓	✓		
CO4	✓		✓	✓		✓	✓	✓		
CO5	✓		✓	✓		✓	✓	✓		
Number of Matches 31, Correlation: High										

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBFAAL21	Other Elective Course	GOODS AND SERVICES TAX	4	4
Instructional Objectives				
1. To know the role of taxation policy in India 2. To understand the concept of GST 3. To find out the various types of GST and its structure. 4. To know the registration process 5. To make clear the procedure of Tax on Goods and Services				
Unit-I	Taxation System:			12 Hours
Tax – Definition- Meaning- Importance- Canon of Taxation- Types of tax- - Scope- - Direct tax- Meaning- Importance- Indirect tax- Meaning- Importance- Advantages and Disadvantages of Direct and Indirect tax-VAT- Stages and Evolution of Goods and Services Tax (GST)- Difference between GST Vs. VAT- Meaning of GST- Features o GST				
Unit-II	Subsumed Taxes in GST			12 Hours
Subsumed of taxes in GST- State Government and Central Government Taxes- Luxury Tax- Lottery tax purchase tax Stamp duty- Goods and leverage taxes- tax on vehicles- Electricity- Banking- Real estate- Custom duty- Central Excise duty- Additional duties of custom.				
Unit-III	GST Structure			12 Hours
Structure of GST- Implementations of GST- Benefits of GST to stakeholders- Functions of GST- Benefits of GST- GST Council and its structure – Powers and functions of GST Council- important concepts and definitions under GST Act- Levy and collection of taxes- Rates of GST- Exempted goods and services – 0%, 5%, 12%, 18% and 28% rate on goods and services. Harmonized commodity code (HSN Servicing Accounting Code- Implication under GST-HSN and SAC under GST in India. Activity: List of GST tax rate				
Unit-IV	Registration and GST Components			12 Hours
Supply under GST- Meaning of supply- Importance of supply – Scope of supply- Time and value of supply- Place of supply- various forms of supply- Aggregate Turnover- E- Way Bill- Registration – persons liable for registration- persons not liable for registration- Compulsory registration- Deemed registration- Procedure for registration- Cancellation of registration- Revocation of cancellation- Goods and Services Tax Identification Number (GSTIN). Activity: Specimen copy of E-Way bill				
Unit-V	Procedure and Payment of Tax			12 Hours
Input tax credit- Manner of claiming input tax credit- input tax credit in different situations- Recovery of credit – Tax invoice credit note- Debit Note- Electronic cash ledger- Electronic credit ledger- Accounts and records- Period of retention of accounts and records- Audit- Returns- Furnishing details of supply- Payment of Tax- Tax invoices- TDS- Collection of Taxes at source- Inspection of goods in movement- Power of authorities- Furnishing of returns- Appeals- Appellate authorities- Procedure of appeals- Offences and penalties. Activity : Specimen copy of various forms of Returns				
Books for Study:				
1. Text book on Goods and Services Tax Laws, <u>Prof. Jayakumar Sithanandam</u> , White Falcon Publishing, chandigarh, 2020.				

2. GST The Essentials of Goods and Services Tax, Himalaya Publications, New Delhi, 2019
3. Indirect Taxation, Dr.P.K.Sinha & Dr.Sachin U Chavan, Everest Publishing House, Pune, 2021
4. Business Taxation (Goods and Services Tax), T.S Reddy and Y.Hari Prasad Reddy, Margham Publication, Chennai-2020
5. Indirect Taxation, Dr.V.Surekha and Prita Davidson, Charulatha Publication, Chennai, 2020

Books for Reference:

1. Goods and Services Tax GST, H.C. Mehrotra & V.P. Agarwal , Sahitya Bhawan Publications, Agra, 2020
2. Goods and Services Tax, CA. Rohini Aggarawal, Dr. Neelam Goel, Sultan Chand, New Delhi, 2021.
3. GST Concepts for all , Bishal Kumar Agarwal & C.S Vias Agarwal, Laxmi Publications Pvt Ltd, New Delhi, 2021
4. Fundamentals of Goods and Services Tax, Vinet Gupta and Dr.N.K Gupta, Bharat Law House Pvt Ltd, New Delhi, 2021
5. GST Made Easy, Arpit Haldia , Taxmann Publication, New Delhi, 2019.

Course Learning Outcomes

- CLO1 Understand the framework of Taxation system in India
 CLO2 Identify the various forms of Indirect Taxes under GST
 CLO3 Comprehend knowledge on GST Council and rate of Tax on goods and services
 CLO4 Familiarize the components of GST and Registration Process
 CLO5 Obtain the knowledge of Tax Filling procedure payment of GST

Website Sources:

1. <http://www.gstcouncil.gov.in/>
2. <https://cleartax.in/s/gst-council>
3. <https://www.cbic.gov.in/>
4. <https://cbic-gst.gov.in/>
5. <https://tallysolutions.com/>

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the framework of Taxation system in India	K1, K2, K3
CO2	Identify the various forms of Indirect Taxes under GST	K2, K3, K4
CO3	Comprehend knowledge on GST Council and rate of Tax on goods and services	K1, K2, K3
CO4	Familiarize the components of GST and Registration Process	K1, K2, K3, K6
CO5	Obtain the knowledge of Tax Filling procedure payment of GST	K2, K3, K4, K5, K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBFAAL22	OEC	FINANCIAL MARKETS	4	3
Instructional Objectives				
1. To know about the importance of Financial System in India. 2. To make the students to understand the method of floating new issues. 3. To familiarize the concept of secondary market. 4. To get a knowledge of online trading. 5. To impart the basic knowledge of the financial derivatives and its kinds.				
Unit-I	Financial System in India			12 Hours
Financial System–Functions- Financial Concepts- Financial Assets- Financial Intermediaries- An overview of Indian Financial System-Financial Markets – Importance of Capital Market - Money Market – Foreign Exchange Market – Financial Rate of Return – Financial Instruments – Development of Financial System in India and its Weaknesses.–				
Unit-II	Money Market			12 Hours
Definition - Money Market Vs. Capital Market – features – Characteristics features of developed Money Market – Importance – Composition of Money Market – Call Money Market, Commercial Bills, Discount Market, Bill Market, Bill Market Scheme, Treasury Bill Market – Money Market Instruments- Commercial Papers, certificate of Deposit(CD), Interbank Participatory Certificate, Repo Instruments – Structure of Indian Money Market – Features and its deficiencies.				
Unit-III	New Issue Market			10 Hours
Meaning – Stock Exchange – Distinction between New Issue Market and Stock Exchange – Functions of New Issues Market – Methods of Floating New Issues – General Guidelines – Principle Steps of a Public Issue – Instruments of Issue – Players – Recent trends – Performance and Advantages of New Issues-Suggestions. Activity : Share Trading Practical				
Unit-IV	Secondary Market			14 Hours
Introduction – Functions and services of Stock Exchange – Recognition of Stock Exchange – Procedure – Organisation – Listing of Securities – Listing Procedure - Registration, Procedure, Code of Conduct and Functions of Brokers – Kinds of Brokers – Method of Trading in Stock Exchange – Current Settlement Procedure of Trading Transactions - Online Trading – NSE– NEAT System – Kinds of Speculators – Speculative Transactions – Stock Indices - Demat Account – Procedure of opening and operating Demat Account.– Activity : Specimen of share application form : Opening of Demat Account				
Unit-V	Securities Exchange Board of India			12 Hours
Controller of Capital Issues (CCI) – Securities Contract (Regulations) Act – Malpractices in Securities Market – Deficiencies in the Market – SEBI Guidelines – Prohibition of Unfair Trade Practices – Recent Guidelines – OTCEI, NSE, BSE, MCX-SX – Depository Systems – Meaning – Objectives – Activities. Activity : Graphs and Diagram Showing Price movements of shares				
Books for Study:				
1. E.Gordon K.Natarajan, “Financial Markets and Services” Himalaya Publishing House, Channai. 2019				

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Describe the various financial systems in India.	K1, K2, K3
CO2	Gain the knowledge of the procedure on new issue market.	K1, K2, K3, K4
CO3	Understand the idea about stock exchange and its role.	K1, K2, K3
CO4	Analyze the trading of stock exchange.	K1, K2, K3, K5
CO5	Outline the concepts of derivatives & its function.	K1, K2, K3

KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create

Course Outcomes (COs)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	✓		✓	✓			✓	✓	✓	
CO2	✓	✓	✓	✓		✓	✓	✓		
CO3	✓		✓	✓			✓	✓		
CO4	✓		✓	✓	✓		✓	✓		✓
CO5	✓	✓	✓	✓			✓	✓		
Number of Matches 31, Correlation: High										

DEPARTMENT OF COMMERCE

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCO1001	DSC	FINANCIAL ACCOUNTING I	7	6
Course Objectives				
1. To enlighten the students with various Concepts of Accounting. 2. To impart knowledge of Accounting Principles & Conventions. 3. To impart practical knowledge in the Preparation of Accounts				
Unit-I	Accounting Framework			21 Hours
Conceptual Framework: Accounting Principles - Accounting Concepts - Accounting Conventions – Introduction to AS, Ind-AS & IFRS – Accounting Process: Journal – Ledger – Trial Balance – Meaning and Types of Accounting Errors. Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Adjustments in Final Accounts: Outstanding Expenses – Prepaid Expenses – Accrued Income - Income Received in Advance - Depreciation and Appreciation of Fixed Assets – Interest on Capital – Interest on Drawings.				
Unit-II	Depreciation Accounting & BRS			21 Hours
Depreciation – Causes – Methods of providing Depreciation – Straight Line Method – Diminishing Balance Method – Annuity Method – Sinking Fund Method (Simple Problems only). Bank Reconciliation Statement – Meaning – Need – Preparation of Bank Reconciliation Statement.				
Unit-III	Average Due Date and Fire Insurance Claims			21 Hours
Average Due Date – Determination of Due Date – Calculation of Interest. Meaning of Fire Insurance – Need for Fire Insurance – Computation of Claims to be lodged for loss of stock – Average Clause.				
Unit-IV	Single Entry System			21 Hours
Single Entry System – Objectives – Features – Limitations – Differences between Single Entry and Double Entry System – Ascertainment of Profits through Net worth Method (Statement of Affairs) and Conversion Method.				
Unit-V	Partnership Accounts			21 Hours
Partnership – Features – Types of Partners - Admission of a Partner – Retirement of a Partner - Calculation of New Ratio, Sacrificing Ratio & Gaining Ratio – Calculation of Goodwill – Preparation of Revaluation Account, Capital Account and Balance Sheet at the time of Admission and Retirement. Dissolution - Meaning – Modes - Dissolution of Partnership and Dissolution of Firm (Concepts Only).				
Books for Study:				
1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi. 3. S. Thothadri and S. Nafeesa, Financial Accounting, McGraw Hill Education, Chennai.				

Books for Reference:

1. **M.C.Shukla, T.S.Grewal, S.C. Gupta**, Advanced Accounts – Volume I, S.Chand& Co., - New Delhi.
2. **S.P. Jain and K.L.Narang**, Financial Accounting, Kalyani Publishers, Ludhiana.
3. **V.K.Goyal**, Financial Accounting, Excel Books, New Delhi.
4. **S.M. Shukla**, Financial Accounting, Sahitya Bhawan Publications, Agra.
5. **Mukherji & M. Hanif**, Financial Accounting, Tata McGraw Hill Pub. Co. Ltd., New Delhi.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Pass Journal Entries; Prepare Ledger Accounts, Trial Balance and Final Accounts.	K2, K3, K4
CO2	Calculate Depreciation, Prepare Depreciation Account and Prepare Bank Reconciliation Statement.	K2, K3, K4
CO3	Calculate Average Due Date and compute Fire Insurance Claims.	K2, K3, K4
CO4	Prepare Statement of Affairs and Statement of Profit or Loss in Single Entry System.	K2, K3, K4
CO5	Prepare Revaluation Account, Capital Account and Balance Sheet while admission and retirement of a partner.	K2, K3
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓		✓	✓		✓
CO2	✓	✓	✓		✓	✓		✓
CO3	✓	✓	✓		✓	✓		✓
CO4	✓	✓	✓		✓	✓		✓
CO5	✓	✓	✓		✓	✓		✓
Number of matches = 30, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBSKB102	SEC	Professional Communication for Commerce & Management	3	3
Course Objectives				
4. To teach the basic elements and conceptual knowledge of professional communication.				
5. To impart the procedural knowledge of listening to process description and excellent presentation skills				
6. To enlighten the meta cognitive knowledge of digital trends in professional communication.				
Unit-I	Introduction to Communication			9 Hours
Communication - Features - Need - Importance - Process - Principles - Modes - Types - Flow of Communication - Barriers to Communication.				
Unit-II	Professional Communication			9 Hours
Professional Communication - Features - Functions – Essentials - Kinds - Components - Layout - Common Errors - Communication Ethics – Professional Etiquettes.				
Unit-III	Description			9 Hours
Listening to Process Description – Drawing a Flow Chart – Role Play – Skimming and Scanning – Reading Passages on Products, Equipment and Gadgets –Process Description – Compare and Contrast Paragraph – Sentence Definition and Extended Definition – Precise Writing.				
Unit-IV	Presentation Skills			9 Hours
Presentation – Developing Professional Presentation - Listening to Lectures – Short Talks – Reading Comprehension Passages – Writing Recommendations – Interpreting Visual Inputs – Register Specific – Incorporate into the LSRW Tasks.				
Unit-V	Digital Communication			9 Hours
Digital Communication – Features – Pros & Cons – Types – E-Mail Etiquettes - Collaborative Digital Workspaces - Unified Communications – Virtual Meeting – Intranet for Communications within Organisation - Mobile Applications.				

Books for Study:

1. **Thameemul Ansari S & Ragavan N**, Business Communication, Shri Sai Publishers' Distributors, Chennai.
2. **Raghunathan & Santhanam**, Business Communication, Margham Publications
3. English for Commerce and Management, Tamil Nadu State Council for Higher Education.

Books for Reference:

1. **Bob Dignen**, Communicating in Business English (with Audio CD)
2. **Bryan A. Garner**, HBR Guide to Better Business Writing (HBR Guide Series)
3. **Rajendra Pal, J.S. Korlahalli**, Essentials of Business communication, Sulthan Chand & Sons, New Delhi.
4. **Shirley Taylor**, Communication for business, pearson publication, New Delhi.
5. **CB Gupta**, Basic Business Communication, Sultan Chand & Sons, New Delhi.

E-Contents:

5. <https://courses.lumenlearning.com/wm-businesscommunicationmgrs/>
6. <https://open.lib.umn.edu/businesscommunication/>
7. https://www.tn.gov/content/dam/tn/education/ccte/bus/cte_std_business_communications.pdf
8. <https://edu.gcfglobal.org/en/business-communication/business-writing-essentials/1/>
5. <https://www.youtube.com/watch?v=SSgOiUNxlOA>

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Discuss the concept, features, process and principles of communication.	K2
CO2	Enumerate the functions & kinds of Professional Communication, Communication ethics and Professional etiquettes.	K4
CO3	Draw a Flow Chart and Prepare Skimming and Scanning.	K3
CO4	Present Short Talks and Draft Recommendations.	K6
CO5	Define various forms of Digital Communication.	K1
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓	✓		✓		
CO2		✓	✓			✓		✓
CO3		✓	✓			✓		
CO4		✓	✓	✓		✓	✓	✓
CO5		✓	✓	✓		✓		
Number of matches = 21, Correlation: Moderate								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCOAL11	OEC	MODERN BUSINESS ORGANISATION	7	5
Course Objectives				
1. To equip learners with working of different forms of business organisations as well as emerging modes of business				
2. To teach various organisational structure and forms of business organisations.				
3. To impart knowledge on various business services.				
Unit-I	Nature and Purpose of Business			21 Hours
Business - Characteristics – Business Vs. Profession – Business Vs. Employment - Objectives of business - Economic and Social - Classification of business activities- Industry, Trade and Commerce.				
Unit-II	Organisational Structure			21 Hours
Concept, Importance and types of structure – Hierarchical - Functional - Flat – Line Organisation – Divisional - Matrix - Team-based - Network - Mintzberg's five types of Organisational structure - Formal and Informal Organisation – Delegation - Elements - importance – Decentralization - Importance – Delegation vs. Decentralisation.				
Unit-III	Forms of Business Organisations			21 Hours
Sole Proprietorship – Features - Merits and Limitations - Partnership – Features – Types of Partners – Merits and Limitations of Partnership - Registration of a Partnership Firm - Partnership Deed – LLP – Features - Merits & Limitations – Company – Features, Merits and Limitations of various Types – Public Co. – Private Co. – OPC.				
Unit-IV	Business Services			21 Hours
Banking – Insurance - Insurance vs. Assurance – Types of Insurance – Life Insurance – Types – General Insurance – Types – Logistics - Delivery Platforms - Telecom Services – Broadband – Health & Wellness - IT/ITES – Software as a Service (SaaS) – Consultancy – Types - Education & Training – Security - Cyber Security – Hospitality – Travel & Tourism – Food & Catering - Waste Management – E-Waste Management – Bio Waste Management.				
Unit-V	Emerging Modes of Business			21 Hours
E-business - E-Commerce - Scope - Benefits – M-Commerce - Outsourcing – Types - BPO (Business Process Outsourcing) - KPO (Knowledge Process Outsourcing) - LPO (Legal Process Outsourcing) – EPO (Educational Process Outsourcing) – PPP – MNCs – REITs - Franchise – License – Joint Ventures.				
Books for Study:				
1. C.B.Gupta, Business Organisation and Management, Sultan Chand & Sons, New Delhi.				
2. C.D. Balaji and G.Prasad, Business Organisation, Margham Publication, Chennai.				
3. K.Sundar, Business Organisation, Vijay Nicole Imprints (P) Led., Chennai.				
Books for Reference:				
1. M.C. Shukla, Business Organisation and Management, S.Chand Publishing, New Delhi.				
2. Robbins, S. T., Judge, T. A., & Hasham, E. S. (2013). Organisational Behavior. Pearson.				

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concept of business, objectives and classification.	K2
CO2	Knowledge on the relevance of different types of organizational structure	K1
CO3	Analyse different forms of business organizations.	K4
CO4	Evaluate the various business services and waste management.	K5
CO5	Create the emerging modes of business and its benefits.	K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓	✓	✓	✓	
CO2		✓	✓		✓		✓	✓
CO3	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓		✓			✓
CO5	✓	✓	✓	✓	✓		✓	✓
Number of matches =29, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCO2001	DSC	FINANCIAL ACCOUNTING II	5	4
Course Objectives				
1. To enlighten the students with various Concepts in Accounting. 2. To impart theoretical framework of Functional Accounting. 3. To impart practical knowledge in the Preparation of Accounts.				
Unit-I	Branch Accounting			15 Hours
Branch - Types – Branch Accounting – Objectives - Accounting for Dependent Branches – Debtors System – Stock and Debtors System – Final Account System.				
Unit-II	Departmental Accounting			15 Hours
Department - Distinction between Departments and Branches – Allocation of Common Expenses – Expenses which cannot be allocated – Preparation of Departmental Accounts – Inter Departmental Transfers at cost price. (Simple Problems only).				
Unit-III	Hire Purchase System			15 Hours
Hire Purchase System – Features – Accounting Treatment in Hire Purchase System – Calculation of Interest – Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire Vendor – Meaning of Default and Repossession.				
Unit-IV	Instalment Purchase System			15 Hours
Instalment Purchase System – Features – Distinction between Hire Purchase and Instalment Purchase System – Accounting Treatment in Instalment Purchase System.				
Unit-V	Accounting for Non Profit Organizations			15 Hours
Preparation of Receipts and Payments Account – Preparation of Income and Expenditure Account. (Simple Problems only).				
Books for Study:				
1. T.S. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai. 2. R.L.Gupta and M. Radhaswamy, Financial Accounting, Sultan Chand & Sons., New Delhi. 3. S. Thothadri and S. Nafeesa, Financial Accounting, McGraw Hill Education, Chennai.				
Books for Reference:				
1. M.C.Shukla, T.S.Grewal, S.C. Gupta, Advanced Accounts – Volume I, S.Chand& Co., -				

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCO2002	DSC	BUSINESS MANAGEMENT	4	3
Course Objectives				
1. Teach the concept and principles of Management. 2. Educate the conceptual knowledge of Planning and Organising. 3. Impart the knowledge of Directing, Controlling and Motivation.				
Unit-I	Introduction to Management			12 Hours
Management – Nature – Scope – Levels - Importance - Functions – Management as an Art, Science or Profession - Management vs Administration - Contributions of FW Taylor, Henry Fayol and Elton Mayo – Manager – Qualities of a successful Manager – The Management Process (POSDCORB).				
Unit-II	Planning			12 Hours
Planning – Definition – Nature – Importance – Types - Steps – Objectives. Forecasting – Meaning – Purpose – Methods. Decision Making – Meaning – Process.				
Unit-III	Organising			12 Hours
Organising – Nature – Purpose – Principles – Process – Organization Structure – Committees - Chain of Command – Authority, Responsibility & Accountability – Centralization vs Decentralisation of Authority – Span of Management.				
Unit-IV	Staffing and Directing			12 Hours
Staffing – Functions – Motivation – Nature – Process – Significance at workplace - Theories - Maslow’s – McGregor’s – McClelland - Directing – Nature – Principles and techniques of Directing.				
Unit-V	Co-ordination and Controlling			12 Hours
Co-ordination - Meaning – Importance – Techniques - Controlling – Features – Steps - Techniques of Controlling – Budgetary and Non-Budgetary Control.				
Books for Study:				
7. C.B. Gupta, Business Management Theory and Practice – Sultan Chand & Sons, New Delhi. 8. J. Jayasankar, Principles of Management, Margham Publications, Chennai. 9. P.C Tripathi & P.N.Reddy –Principles of Management-Tata Mc.Graw Hill.				
Books for Reference:				
10. L.M. Prasad, Principles and Practice of Management, Sultan Chand & Sons, New Delhi. 11. Harold Koontz, Cyril O'Donnell, Principles of Management – An Analysis of Managerial Functions, International Student, New Delhi. 12. Peter Ferdinand Drucker, Management Cases, Harper and Row Publishers, New York. 13. Sharma & Shashi K Gupta – Principles of Management-Kalyani publishing House, New Delhi. 14. Stephen P. Robbins et.al., Fundamentals of Management, Pearson				

Methodology of Teaching:**Chalk and Talk, ICT Presentation, Video lectures**

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explain the principles of Management.	K1
CO2	Classify Planning, Forecasting.	K2
CO3	Summarize the Process of Organising	K2
CO4	Describe the functions of Staffing and Principles of Directing.	K1
CO5	Apply the Controlling Techniques.	K3
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓	✓		✓		✓
CO2		✓	✓	✓		✓		✓
CO3		✓	✓	✓		✓		✓
CO4		✓	✓	✓		✓		✓
CO5		✓	✓	✓		✓		✓
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCOAL21	OEC	LEADERSHIP AND TEAM DEVELOPMENT	4	4
Course Objectives				
1. To enlighten the students about the significance of Leadership				
2. To familiarize students about the significance of Team Work and Development				
3. To enhance Leadership Creative Skill in students				
Unit-I	Leadership			12 Hours
Leader - Qualities of a Good Leader - Managers vs Leaders - Types of leader - Leadership – Importance – Leadership Styles – Transformational and Transactional Leadership - Theories of Leadership.				
Unit-II	Team Work & Development			12 Hours
Team – Meaning – Team Work – Foundations of Team Work – Importance –Team Development – Creating Effective Teams – Values & Culture in Team Development – Team Decision Making.				
Unit-III	Employee Engagement			12 Hours
Employee Engagement – Meaning – Types – Importance - Factors – Strategies - Work Life Balance – Significance - Impact of Work Life Imbalance – Ways to improve Work Life Balance.				
Unit-IV	Stress & Conflict Management			12 Hours
Stress – Causes – Coping Mechanism - Conflict – Meaning – Stages – Types - Sources – Conflict Management – Meaning – Importance – Process.				
Unit-V	Leadership Skill			12 Hours
Leadership Skills - Managing Power- Problem Solving – Negotiation – Coaching & Mentoring - Creativity – Strategy - Planning and Goal Setting - Leadership and Systems Thinking.				
Books for Study:				
1. Prasad, L.M., Principles and Practices of Management, Sultan Chand & Sons, New Delhi.				
2. L.M. Prasad, Organisational Behaviour, Sultan Chand and Sons, New Delhi.				
3. Dr. B. Rathan Reddy, Team Development & Leadership, Jaico Publishing House, India.				
Books for Reference:				
1. K. Aswathappa, Organizational Behaviour, Himalaya Publishing House, New Delhi.				
2. Dr.C.B.Gupta, Dr. Shruti Mathur, Management: Principles and Applications, Scholar Tech Press.				
3. V K Jain, Om Prakash Biyani, Business Communication, S. Chand, New Delhi.				
4. Robbins, S P., Judge, T A and Vohra, N, Organizational Behavior. 16th Edition, Prentice Hall of India.				
5. Yukl, G A, Leadership in Organizations. 8th Edition. Pearson.				

Methodology of Teaching:**Chalk and Talk, ICT Presentation, Video lectures**

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Identify the Qualities of a Good Leader	K1,K2
CO2	Comprehend the Importance of Team Work	K1, K2
CO3	Understand the benefits of Employee Engagement	K2
CO4	Classify the sources of conflict and measures to tackle them	K2
CO5	Analyze the Leadership Skills	K4
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓			✓
CO2	✓	✓	✓	✓	✓			✓
CO3	✓	✓	✓	✓				✓
CO4		✓		✓				✓
CO5	✓	✓	✓	✓				✓
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCOAP21	OEC	COMPUTER APPLICATIONS IN BUSINESS	4	3
Course Objectives				
1. To impart theoretical and practical knowledge in computers.				
2. To provide practical knowledge in creating business documents.				
3. To make the students understand the role of computers in various fields of business.				
Unit-I	Introduction to Computer			12 Hours
Computer - Characteristics - Advantages - Limitations - Types - Applications – Hardware – Firmware - Live-ware – Software - System Software - Operating System – Translators – Interpreter – Compiler - Overview of Operating System - Functions of Operating System - Application Software - General Purpose Packaged Software and Tailor-Made Software.				
Unit-II	Role of Computers in Business and Internet			12 Hours
Role of Computers in different areas of Business activities: Accounts & Finance – Marketing – Production - Distribution – Inventory Management – HRM - Payroll Management – Advertisement & Sales Promotion - Retail Management.				
Meaning of Internet - Growth of Internet - Anatomy of Internet - Internet Etiquettes - World Wide Web - Internet Protocols - Usage of Internet to Society - Search Engines.				
Unit-III	Word Document			12 Hours
Introduction to Word Processing - Word Processing concepts - Use of Templates - Working with Word Document: Editing text - Find and Replace text – Formatting - spell check – Autocorrect - Auto text - Bullets and numbering – Tabs - Paragraph Formatting – Indent - Page Formatting - Header and footer - Tables: Inserting - filling and formatting a table - Inserting Pictures and Video - Mail Merge - including linking with Databases and spreadsheet files - Printing documents - Citations and Footnotes – Short Keys/Function Keys.				
Unit-IV	Spreadsheet and its Business Applications			12 Hours
Introduction to Spreadsheet – Application of work sheet/spread sheet in Accounting - Finance and Marketing functions of Business – Spreadsheet basics – Parts of Spreadsheet Menus & Tool bars - Creating a worksheet - Cell referencing - Worksheet to analyze data with graphs, Charts & diagrams – Advanced tools: Functions – Formulae – Formatting numbers - Sorting- Filtering – Validation & Consolidation of Data – Invoice Generation – Budget Preparations – Financial Statements.				
Unit-V	Power Point Presentations			12 Hours
Creating Presentations – Master Template Creation-Importing Images - Insertion of Objects and Charts in slides -Transition and build effects - Types of slides - Slide Views - Formatting – Custom Animation and Transition Making Slideshow - Creating Business Presentation. (Preferably latest version of Power Point presentation).				

Books for Study:

1. **Parameswaran R, Computer Applications in Business, S. Chand & Sons, New-Delhi**
2. **Sanjay Saxena**, Introduction to Computers & MS Office, Vikas Publishing House Pvt. Ltd., New Delhi.
3. **Ananthi Sheshasaayee & Sheshasaayee**, Computer Applications in Business and Management, Margham Publications, Chennai.

Books for Reference:

1. **Alexis Leon & Mathews Leon**, Computer Applications in Business, Vijay Nicole Imprints Pvt.Ltd., Chennai.
2. **Srinivasa Vallabhan, Computer Applications in Business, Sultan Chand & Sons, New Delhi.**
3. **Ed Bott, woody Leonhard**, Using Microsoft Office 2007, Pearson Education, New Delhi.
4. **K. MekalaSharmini,T. Sarah JebaJency**,Computer Applications in Business,Charulatha Publications, Chennai
5. **Pooja Mathur, Dr. Shruti & Jain**, Computer Applications in Business, Galgotia Publishing Company, New Delhi.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the basic concepts of Computers.	K1, K2
CO2	Identify the role of computer in various fields of Business	K1, K2
CO3	Prepare and present the business documents using Word Document.	K3, K6
CO4	Prepare and present the business documents using Excel Sheet.	K3, K6
CO5	Prepare PPT- Power Point Presentation using various Transitions, Animations and other layouts.	K3, K6
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓			✓	✓
CO2	✓	✓	✓				✓	✓
CO3	✓	✓	✓	✓			✓	✓
CO4		✓		✓			✓	✓
CO5		✓		✓			✓	✓
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO1001	DSC	MARKETING MANAGEMENT	6	5
Course Objectives				
1. To provide insight into the Marketing Concept, Market Measurement and Demand Forecasting.				
2. To enlighten Market Segmentation and Marketing Mix.				
3. To impart knowledge on Promotion Mix and Ethical Issues in Marketing.				
Unit-I	Introduction			18 Hours
Marketing – Functions – Modern Concepts of Marketing – Social Marketing – Relationship Marketing – Online Marketing – Tele Marketing – Viral Marketing – Guerrilla Marketing – Ambush Marketing – Marketing Management – Areas of Marketing Management – Marketing interface with other Functional Areas – Marketing Environment – Marketing Research.				
Unit-II	Market Measurement and Demand Forecasting			18 Hours
Market Measurement and Demand Forecasting–Importance – Demand Forecasting – Demand Estimation and Measurement – Characteristics of a Good Demand Forecasting – Steps in Demand Forecasting – Techniques of Demand Forecasting – Demand Forecasting of New Products.				
Unit-III	Market Segmentation, Targeting and Positioning			18Hours
Market Segmentation – Steps in Market Segmentation – Bases and Procedure for Market Segmentation – Criteria for effective Market Segmentation – Target Market – Target Marketing Strategies – Positioning – Concept – Bases and Process – Differentiation Strategies – Market Entry Strategies.				
Unit-IV	Marketing Mix			18 Hours
Marketing Mix – Product – Classification – Product Layer – Product Decisions – Product Life Cycle Strategies – New Product Development Process –Reasons for failure of New Product – Branding – Packaging – Labelling – Pricing – Policies and Strategies – Factors Affecting Price Determination – Physical Distribution.				
Unit-V	Promotion Mix and Marketing Ethics			18 Hours
Promotion – Elements – Factors Affecting Promotion – Personal Selling – Sales Promotion, Publicity and Public Relations – Ethics and Social Responsibility in Marketing – Ethical Decision-Making Process – Ethics in Distribution Management – Ethics in Products and Pricing– Ethics in Promotion and Offering				
Books for Study:				
1. Philip Kotler, Marketing Management, Prentice Hall of India Pvt. Ltd., New Delhi.				
2. RajanSaxena, Marketing Management, Tata McGraw Hill, Chennai.				
3. C.B.Gupta, Marketing Management – Text & Cases, Sultan Chand & Sons, New Delhi.				
Books for Reference:				
1. Ramaswamy V S and Nandakumari S, Marketing Management, McMillan, Delhi.				
2. Bagozzi R P, Principles of Marketing Management, Science Research Associates, Chicago.				

3. **Govindarajan M**, Marketing Management, Prentice Hall of India Pvt. Ltd., New Delhi.
4. **Winer and Dhar**, Marketing Management, Pearson India, New Delhi.
5. **Kotler, Kartajaya and Setiawan**, Marketing 4.0: Moving from Traditional to Digital, Wiley, Canada.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Analyze Marketing Environment and Carryout Marketing Research.	K4
CO2	Evaluate Market and Forecast Demand.	K5
CO3	Devise Market Segmentation.	K4
CO4	Design Marketing Mix.	K6
CO5	Elucidate Promotion Mix and Ethical Issues in Marketing.	K1, K2
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓			✓	✓	✓
CO2		✓	✓			✓	✓	✓
CO3		✓	✓			✓	✓	✓
CO4		✓	✓	✓		✓		✓
CO5		✓	✓	✓		✓		✓
Number of matches = 25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO1002	DSC	ADVANCED MANAGEMENT ACCOUNTING	6	5
Course Objectives				
1. To equip the students with the concepts, methods and techniques of management accounting.				
2. To calculate the ratios and their analysis, preparation of Fund flow and cash flow statements, preparation of budgets and marginal cost statement for decision making				
3. To familiarize the students with Standard costing and Variance analysis.				
Unit–I	Management Accounting and Ratio Analysis			18 Hours
Management Accounting – Objectives –Merits and Demerits – Financial Accounting Vs. Management Accounting – Management Accounting Vs. Cost accounting – Role of Management Accountant – Ratio Analysis – Importance – Classification of Ratios – Computation of Ratios .				
Unit–II	Fund Flow and Cash Flow Analysis			18 Hours
Funds Flow Statement – Advantages and Limitations – Schedule of Changes in Working Capital – Calculation of Funds From Operations – Statement of Sources and Application of Fund – Cash Flow Statement – Distinction between Fund Flow Statement and Cash Flow Statement –Importance – Preparation of Cash Flow Statement as per AS–3 .				
Unit–III	Budget and Budgetary Control			18 Hours
Budget – Meaning – Objectives – Budgetary Control – Essentials of Budgetary Controls – Classification of Budgets – Preparation of Production Budget – Sales Budget – Material Budget– Cash Budget and Flexible Budget – Zero Base Budget (ZBB) .				
Unit–IV	Marginal costing			18 Hours
Marginal Costing – Advantages and Disadvantages – Profit Volume Ratio – Break Even Point – Margin of Safety – Applications of Marginal costing in Decision–making – Make or Buy – Limiting or Key factor – Choice of Profitable Mix.				
Unit–V	Standard Costing and Variance Analysis			18 Hours
Standard Costing – Merits and Demerits – Variance analysis– Importance–Computation of Material Variance – Labour Variance – Overhead Variance – Sales Variance.				
Note: Weightage of marks problems 80% theory 20%				
Books for Study:				
1. R.S.N.PillaiBagavathi Management Accounting S. Chand & Company LTD. New Delhi.				
2. S N Maheswari, Management Accounting, Sultan Chand & Sons, New Delhi.				
3. 4. I M Pandey, Management Accounting, Vikas Publishing House.				
Books for Reference:				
1. Dr.R.Ramachandran and Dr.R. Srinivasan, Management Accounting Sriram Publications– Trichy.				
2. Khan and Jain, Management Accounting, Tata McGraw Hill, New Delhi				
3. Ravi M Kishore, Management Accounting, Taxman Publication, New Delhi				
4. Robert S Kaplan and Anthony Atkinson, Advance Management Accounting, Prentice Hall,				

New Delhi.

5. **Arora, M.N. (2012).** Cost and Management Accounting. Mumbai: Himalaya Publishing House.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand thoroughly the conceptual framework of Management Accounting and identification of differences between various branches of accounting.	K2
CO2	Apply the Ratio analysis, Fund flow Analysis, and Cash flow Analysis to evaluate the financial performance of an organization.	K3
CO3	Prepare various budgets and Compose reports and analysis and take decisions on Price fixation, Make or Buy and Product Mix.	K5
CO4	Gain knowledge on the concept of Cost-volume-profit analysis, Break-even analysis and their applications in businesses.	K1
CO5	Create the knowledge on Standard costing and Analysis of Variance.	K6
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓	✓	✓	✓	✓
CO2	✓	✓	✓			✓		✓
CO3	✓		✓		✓	✓	✓	✓
CO4			✓	✓	✓	✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓
Number of matches =30, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO1003	DSC	ADVANCED BUSINESS STATISTICS	6	4
Course Objectives				
1. To familiarize students with concepts and applications of Statistics in Business				
2. To educate students about the Multiple Correlation and Regression Analysis				
3. To acquaint students with Inferential Statistical Tools used for Business Decision Making				
Unit-I	Introduction			18 Hours
Statistics – Definition – Functions and Limitations of Statistics – Application of Statistics in various fields.Data – Meaning – Kinds – Differences between Primary Data and Secondary Data – Sources of Primary and Secondary Data.				
Activity: Designing Survey Form, Collecting Data using Online Survey Tools, Visualisation of Data through Spreadsheets				
Unit-II	Correlation & Regression Analysis			18 Hours
Correlation – Definition – Uses – Types – First Order Partial Correlation involving 3 variables – Characteristics, Uses & limitations of Partial Correlation Analysis – Multiple Correlation Analysis involving 2 independent variables – Advantages & Limitations of Multiple Correlation Analysis – Regression – Definition – Uses – Correlation vs. Regression – Multiple Regression Analysis involving 3 variables.				
Activity: Determining Partial Correlation, Multiple Correlation and Multiple Regression using Spreadsheets				
Unit-III	Probability Distributions & Statistical Inference			18 Hours
Probability Distribution – Meaning – Concept – Normal Distribution – Poisson Distribution – Binomial Distribution. Statistical Inference – Hypothesis – Hypothesis Testing – Procedure – Errors.				
Activity: Framing Hypothesis to address a Business Decision Problem				
Unit-IV	Chi-Square Test			18 Hours
Chi-Square Test – Conditions – Applications – Test of Independence – Test of Goodness of Fit – Test of Homogeneity – Limitations.				
Activity: Running Chi-Square test in Spreadsheets				
Unit-V	F-Test, ANOVA, t-test and Z-test			18 Hours
F-Test – ANOVA – Assumptions – One-way – Two-way – t-test – Applications – Testing Significance of Mean of a Random Sample – Testing difference between means of two samples (Independent, Dependent) – Testing significance of Correlation Coefficient – Z-test of the Significance of Correlation Coefficient				
Activity: Running F-test, t-test, ANOVA in Spreadsheets				
Books for Study:				
1. Dr. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi.				
2. C.R. Kothari, Quantitative Techniques, Vikas Publishing Houses Pvt. Ltd., Noida.				
3. P.R. Vittal, Business Statistics & Operations Research, Margham Publications				

Books for Reference:

1. **Morris Hamburg**, Statistical Analysis for decision making, Harcourt Trade publishers.
2. **R.S.N. Pillai and Bhagavathi**, Statistics – Theory & Practices, S. Chand & Co., New Delhi.
3. **Kirupa Priyadarsini et. al.**, Business Statistics – Workbook Using Excel, Laxmi Publications Pvt. Ltd.,
4. **J.K. Sharma**, Business Statistics, Vikas Publishing
5. **David M. Levine**, Business Statistics – A First Course, Pearson

Note: Activities to be considered only for Internal Assignments and shall not form part of End Semester Examinations

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems, Practical usage of Computers & Software

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Define Statistics and discuss its Applications and Limitations	K2
CO2	Define Correlation and Regression and understand the types of correlation	K2
CO3	Calculate Partial Correlation Coefficient and Multiple Correlation coefficients and Obtain Linear Multiple Regression equations	K3, K4, K5
CO4	Understand the concept of Probability Distributions and Derive Binomial and Poisson Distributions	K3, K4, K5
CO5	Use Chi-Square test, F-test, ANOVA, t-test and Z-test for testing hypothesis	K3, K4, K5
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓			✓		✓
CO2	✓	✓	✓			✓		✓
CO3	✓	✓	✓			✓		✓
CO4	✓	✓	✓			✓		✓
CO5	✓	✓	✓			✓		✓
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO1004	Discipline Specific Core Course	GLOBAL FINANCIAL SYSTEM	6	4
Course Objectives				
1. To provide an elaborate understanding of both Indian & Global financial system.				
2. To provide knowledge on the financial market and regulatory institutions.				
3. To make the students to understand about financial institutions and financial services.				
Unit-I	Introduction to Indian & Global Financial System			18 Hours
Financial System and its Components – Significance and Role of Financial System in Economic Development – Structure of Indian Financial System – Problem of the Financial System in India – Financial Inclusion – Global Financial System – Components – Role of Global Financial System.				
Unit-II	Indian Financial Markets and Regulatory Institutions			18 Hours
Financial Markets in India – Classification of Financial Markets – Money Market – Features - Functions and Instruments – Role of RBI and Commercial Banks in Indian Money Market - Capital Market – Features - Functions and Instruments – Primary Market - Secondary Market – Government Securities Market – Debt and Derivative Market - Foreign Exchange Market – Foreign Exchange Rate Determinants.				
Unit-III	Financial Institutions			18 Hours
Development Finance Institutions (DFIs) – Banking and Non Banking Financial Institutions – Distinction between Banking and Non Banking Financial Institutions – Commercial banks – Co-operative bank – Rural bank – Non-Banking Financial Intermediaries.				
Unit-IV	Financial Services			18 Hours
Financial Service – Concept – Significance – Types of Financial Services – Hire Purchase – Housing Finance - Mutual Funds – Merchant Banking – Leasing – Factoring – Forfaiting - Venture Capital - Credit Rating and Depository Services.				
Unit-V	Global Financial Institutions & Financial Markets			18 Hours
International Financial Institutions – IMF, World Bank, Asian Development Bank and BRICS Bank – International Financial Markets – NYSE – NASDAQ – TSE – SSE – HKG – LSE – International Money Market – International Equity Market – Factors affecting International Equity Market.				
Books for Study:				
1. Khan MY., Indian Financial System, Tata McGrew Hill Publishing Company				
2. Varshney PN & Mittal DK, Indian Financial System, Sultan Chand & Co., New Delhi				
3. Vasanth Desai, The Indian Financial System, Himalaya Publishing House.				
Books for Reference:				
1. Pathak, Bharati, The Indian Financial System, Pearson Education Publication, New Delhi.				

2. **P. Mohan Rao**, Financial System & Economic Reforms, Deep & Deep Publication Pvt. Ltd. New Delhi
3. **Rajesh Khothari**, Financial Service in India, Sage Publications, New Delhi.
4. **Clifford Gomez**, Financial Market, Institution and Financial Services, Prentice Hall, New Delhi.
5. **Dr.Gurusamy.S**, Financial Markets & Institutions, Tata McGraw Hill Education Private Ltd, New Delhi

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the role of financial system in the country.	K 2
CO2	Classify the functioning of money market and capital market.	K 2
CO3	Analyse the role of RBI and SEBI in financial market.	K 4
CO4	Evaluate the banking and non banking financial institutions.	K5
CO5	Describe various financial services in the economy and its importance.	K3, K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓	✓			✓	✓
CO2		✓	✓	✓			✓	✓
CO3		✓	✓	✓			✓	✓
CO4		✓	✓	✓			✓	✓
CO5		✓	✓	✓			✓	✓
Number of matches =25, Correlation:High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE11	DSE	STRATEGIC MANAGEMENT	6	4
Course Objectives				
1. To give insight to students about Strategic Management				
2. To educate the students about the social aspects of Strategic Management				
3. To enable the students to carry out strategic analysis and appraisal				
Unit-I	Introduction to Strategic Management			18 Hours
Strategy – Meaning and Importance – Policy vs. Strategy – Strategy vs. Tactics – Strategic Decisions – Concept and Nature – Strategic Decisions vs. Operating Decisions– Levels of Strategy – Strategic Management – Concept, Features and Benefits – Process of Strategic Management – Risks of Strategic Management.				
Unit-II	Strategic Intent			18 Hours
Strategic Intent – Strategic Vision – Concept and Significance – Corporate Mission – Concept and Elements – Corporate Objectives – Concept and Need – Goal Setting– Concept, Features and Importance – Individual Goals vs. Organisational Goals.				
Unit-III	Social Aspects of Strategic Management			18 Hours
Social Responsibility – Concept and Nature – Dimensions – Criticism – Benefits – Disclosure of Social Performance – Social Reporting – Social Accounting – Social Audit				
Unit-IV	Strategic Analysis & Appraisal			18 Hours
Environmental Analysis – Nature and Factors – Need for Internal Resource Analysis – Resource Audit – Strategic Advantage Analysis – The Value Chain Method – SWOT Analysis – Environmental Threat and Opportunity Profile (ETOP) Diagnosis Technique– Identification of Core Competencies – Analysis of Corporate Capabilities.				
Unit-V	Formulation, Choice & Implementation of Strategy			18 Hours
Strategy Formulation – Concept and Need – Approaches to Formulation of Strategy– Steps in Strategy Formulation Process – Tips for Strategic Formulation — Choice of Strategy – Gap Analysis – Strategic Implementation – Concept and Major Issues.				
Books for Study:				
1. P.K. Ghosh, Strategic Planning and Management, Sultan Chand & Sons, New Delhi.				
2. L.M. Prasad, Strategic Management, Sultan Chand & Sons, New Delhi				
3. S. Sankaran, Strategic Management, Margham Publications, Chennai				
Books for Reference:				
1. P.C. Jain, Strategic Management (Strategy Formulation and Implementation), Indus Valley Publications, Jaipur / New Delhi.				
2. Jacob Thomas, Strategic Management – Text and Cases, Pearson India Education Services Ltd., Chennai/Delhi.				
3. Azhar Kazmi & Adela Kazmi, Strategic Management, McGrawHill (India) Private Limited, New Delhi.				
4. Robert M. Grant, Contemporary Strategic Management – Case Studies, Blackwell Publishing, New Jersey, US.				
5. Thomas L. Wheelen, Strategic Management and Business Policy: Globalization, Innovation and Sustainability, Pearson				

Methodology of Teaching:**Chalk and Talk, ICT Presentation, Video lectures**

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Differentiate different strategic related terms like strategy, policy, tactics etc.,	K2
CO2	Synthesis a corporate's vision, mission, objectives and goals	K2
CO3	Realise the social responsibility of Corporates towards society	K3
CO4	Carry out the intensive Environmental Analysis of the Corporates	K4
CO5	Identify and enlist the existing core competencies exist in the Organisation and formulate strategy and its implementation	K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓	✓		✓	✓	✓
CO2		✓	✓	✓		✓	✓	✓
CO3		✓	✓	✓		✓	✓	✓
CO4		✓	✓	✓		✓	✓	✓
CO5		✓	✓	✓		✓	✓	✓
Number of matches = 30, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE12	DSEC	CORPORATE MANAGEMENT	6	4
Course Objectives				
1. To give insight to the students about Corporate Management 2. To make the students to conceive the Coporate Structure 3. To enlighten the students about different Corporate and Business Strategies				
Unit–I	Introduction to Corporate Management			18 Hours
Corporate Management – Nature and Scope – Need for Corporate Management – Corporate Planning – Implementation of Corporate Plan – Review and Evaluation of Corporate Plan – Approaches to Corporate Management – Strategists and their Role in Corporate Management – Corporate Management in Non–Business Organisations.				
Unit–II	The Basics of Corporate Structure			18 Hours
Understanding Corporate Structure – Board of Directors (BODs) – Appointment and Removal – Role and Functions – Director types – Inside Directors – Outside Directors – Chair of the Board (COB) – Role – Management Team – Chief Executive Officers (CEOs) – Role and Functions – Chief Operating Officers (COOs) – Role, Types and Qualifications – Chair Vs. CEO –Chief Financial Officer (CFOs) – Role and Functions.				
Unit–III	Corporate Management Rules and Models			18 Hours
Rules of Corporate Management – Corporate Management Models – Anglo–American Model – German Model – Japanese Model – Role and Responsibilities of Corporate Managers – Factors for Successful Corporate Management – Working of Corporate Management – Creation of Corporate Management Strategy.				
Unit–IV	Corporate Strategy			18 Hours
Corporate Strategy – Concept – Components – Levels – Corporate Strategy vs. Business Strategy – Need for Corporate Strategy –Importance and Benefits of Corporate Strategy – Grand Strategy Alternatives – Growth Strategy, Stability Strategy, Retrenchment Strategy and Combination Strategy – External Growth Strategy – Mergers, Acquisitions and Joint Ventures.Choice of Strategy – Concept and Factors.				
Unit–V	Business Strategy			18 Hours
Porter’s Generic Business Strategies – Cost Leadership Strategy – Differentiation Strategy – Focus Business Strategy – Criticism of Generic Strategies – Red Ocean Strategy vs. Blue Ocean Strategy – Red Ocean Traps.				
Books for Study:				
1. L.M. Prasad , Strategic Management, Sultan Chand & Sons, New Delhi 2. P.C. Jain , Strategic Management (Strategy Formulation and Implementation), Indus Valley Publications, Jaipur / New Delhi. 3. P.K. Ghosh , Strategic Planning and Management, Sultan Chand & Sons, New Delhi.				
Books for Reference:				
1. B. Narayan , Corporate Management, A.P.H. Publishing Corporation, New Delhi. 2. Ronald J. Burke , Women in Corporate Management, Springer Science plus Business Media, Berlin, Germany.				

3. **Gianfranco Zanda**, Corporate Management in a Knowledge–Based Economy, Palgrave Macmillan, London/Newyork/Shanghai
4. **Azhar Kazmi & Adela Kazmi**, Strategic Management, McGraw Hill (India) Private Limited, New Delhi.
5. **Robert M. Grant**, Contemporary Strategic Management – Case Studies, Blackwell Publishing, New Jersey, US.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Plan, Review and Evaluate Corporate Plan	K5
CO2	Conceive the role of a strategist in an Organisation	K2
CO3	Understand the corporate structure of any Organisation	K2
CO4	Understand the role and responsibilities of Corporate Managers and perceive the working of Corporate Management in the right sense	K4
CO5	Choose the right strategy in the given situation and safeguard self from being trapped in Red Ocean	K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓		✓		✓
CO2	✓	✓	✓	✓		✓		✓
CO3	✓	✓	✓			✓		✓
CO4	✓	✓	✓	✓		✓		✓
CO5	✓	✓	✓	✓		✓		✓
Number of matches = 29, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE13	DSEC	CORPORATE LAWS	6	4
Course Objectives				
1. To acquaint students with basic concepts related to companies 2. To equip students with knowledge of SEBI Act, 1992 and FEMA Act, 1999 3. To introduce students to the Insolvency and Bankruptcy Code, 2016				
Unit–I	Corporate Laws			18 Hours
Corporate Laws – Importance – Companies Act, 2013 – Definitions – Incorporation & Registration of a Company – Management & Administration of a Company – Meetings of Board & its powers				
Unit–II	Competition Act, 2002			18 Hours
Competition Act, 2002 – Introduction – Objectives – Important Definitions – Prohibition of Anti–Competitive Agreements – Prohibition of Abuse of Dominant position – Regulation of Combinations – Competition Commission of India – Composition – Duties, Powers and Functions – Penalties – Appellate Tribunal – Procedures & Powers – Powers of the Central Government.				
Unit–III	The Securities and Exchange Board of India Act, 1992			18 Hours
The Securities and Exchange Board of India Act, 1992 – Introduction – Objectives – Important Definitions – Powers and Functions of SEBI – Registration – Penalties – General conditions for Public Issues – Rights Issues – Initial Public Offer – Follow–up Public Offer – Promoters Contribution – Listing of Securities – Conditions for Listing – Types of Listing – Procedure for Listing Requirements – Benefits of Listing – Defects of Listing.				
Unit–IV	The Foreign Exchange Management Act, 1999			18 Hours
The Foreign Exchange Management Act, 1999 – Introduction – Objective – Differences and Similarities between FERA and FEMA – Important Definitions under the Act – Provisions related to Regulation and Management of Foreign Exchange – Authorised Person – Offences – Contraventions & Penalties – Adjudication & Appeals – Appellate Tribunal – Directorate of Enforcement				
Unit–V	Insolvency and Bankruptcy Code, 2016			18 Hours
Insolvency and Bankruptcy Code, 2016 – Introduction – Objectives – Applicability of the Code – Important Definitions – Relationship between Bankruptcy, Insolvency and Liquidation – Corporate Insolvency Resolution Process – Liquidation Process – Fast Track Insolvency Process for Corporate Persons – Voluntary Liquidation – Adjudicating Authority – Offences and Penalties – Insolvency and Bankruptcy Board of India – Insolvency Professional Agencies – Insolvency Professionals – Information Utilities – Powers of Central Government – Banning of Unregulated Deposit Schemes Rules.				
Books for Study:				
1. Taxmann's Corporate Laws, Taxmann, New Delhi				
2. J. Jayasankar, Corporate Laws, Margham Publications, Chennai				

3. **Gulshan, S.S.**, A Hand book of Corporate Laws, S. Chand & Co, New Delhi

Books for Reference:

1. **Bharat Bhushan, N.D. Kapoor, Dr. Rajni Abbi & Rajiv Kapoor**, N.D. Kapoor's Elements of Mercantile Law, Sultan Chand & Sons Pvt. Ltd., New Delhi.
2. **K. Aswathappa & G. Sudarsana Reddy**, Business Regulations, Himalaya Publishing House, Mumbai.
3. **Dr. MR Sreenivasan**, Business Law (Commercial Law), Margham Publications, Chennai.
4. **K.G. Garg, Mukesh Sharma**, et.al., Business and Corporate Law, Kalyani Publishers, New Delhi..

5. **Dr. S. Sankaran**, Corporate And Economic Laws, Margham Publications, Chennai.

E– Resources:

1. The Institute of Chartered Accountants of India's Study Material for Competition Act, 2002: <https://resource.cdn.icai.org/47565bosfinal-p6d-cp2.pdf>
2. The Institute of Chartered Accountants of India's Study Material for The Foreign Exchange Management Act, 1999: <https://resource.cdn.icai.org/47681bosfinal-p6d-cp6.pdf>
3. The Institute of Chartered Accountants of India's Study Material for The Insolvency and Bankruptcy Code, 2016: <https://resource.cdn.icai.org/47588bosfinal-p6d-cp4.pdf>
4. The Institute of Cost Accountants of India's Study Notes for Corporate Laws: <https://icmai.in/upload/Students/Syllabus2016/Final/Paper-13-Revised-Aug.pdf>
5. The Competition Act, 2002 Bare Act at India Code – Digital Repository: https://indiacode.nic.in/handle/123456789/2010?view_type=browse
6. The Securities and Exchange Board of India Act, 1992 Bare Act at India Code – Digital Repository: https://indiacode.nic.in/handle/123456789/1890?view_type=search&sam_handle=123456789/1362
7. The Securities and Exchange Board of India Act, 1992 Bare Act at SEBI's Website: https://www.sebi.gov.in/legal/acts/jan-1992/securities-and-exchange-board-of-india-act-1992-as-amended-by-the-finance-no-2-act-2019-_3.html
8. Securities Contracts (Regulation) Act, 1956 at SEBI's Website: <https://www.sebi.gov.in/acts/contractact.pdf>
9. The Foreign Exchange Management Act, 1999 Bare Act at India Code – Digital Repository: https://indiacode.nic.in/handle/123456789/1988?view_type=search&sam_handle=123456789/1362
10. The Insolvency and Bankruptcy Code, 2016 at India Code – Digital Repository: https://indiacode.nic.in/handle/123456789/2154?view_type=browse&sam_handle=123456789/1362

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Describe the significance of Corporate laws	K1,K2
CO2	Summarize Competition Act 2002.	K2
CO3	Illustrate the provisions related to listing of Securities, Public Offerings and discuss the Prohibition of Insider Trading in various regulations of SEBI	K4
CO4	Understand the provisions related to Regulation and Management of Foreign Exchange, Related Offences, Penalties and Appeals Procedure under FEMA, 1999.	K2
CO5	Explain the Corporate Insolvency Resolution Process and Code, Liquidation Process under Insolvency and Bankruptcy, 2016.	K1
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓			✓	✓
CO2	✓	✓	✓	✓				✓
CO3		✓	✓	✓				✓
CO4		✓	✓	✓			✓	✓
CO5	✓	✓	✓	✓				✓
Number of matches = 25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO2001	DSC	STRATEGIC HUMAN RESOURCE MANAGEMENT	5	5
Course Objectives				
1. To make students realise the significance of strategic management in human resources.				
2. To familiarize the students with various HR Strategies.				
3. To make the students understand the components of various HR Strategies.				
Unit-I	Introduction to SHRM			15 Hours
Human Resource Management (HRM) – Concept – Objectives – Characteristics – Functions.				
Strategic Human Resource Management (SHRM) – Basis – Principles – Aims – Concepts – The Best Practice Approach – The Best Fit Approach.				
Unit-II	Developing HR Strategies			15 Hours
HR Strategies – Meaning – Purpose – Overall HR Strategies – Specific HR Strategies – Criteria for an Effective HR Strategy – HR Strategy Development – Implementing HR Strategies – Impact of Strategic HRM – Characteristics of Strategic HRM.				
Unit-III	Employee Resourcing and Rewarding Strategies			15 Hours
Employee Resourcing Strategy – Objectives – Approach – Components – HR Planning – Employee Value Position – Resourcing Plan – Retention Strategy – Flexibility Strategy.				
Reward Strategy – Characteristics – Structure – Content – Guiding principles – Effective Reward Strategies.				
Unit-IV	Human Capital Management & High Performance Strategies			15 Hours
Human Capital Management Strategy – Concept – Aims – High Performance Strategy – Concept – Characteristics of a High Performance Work System (HPWS) – Components of a HPWS.				
Unit-V	Knowledge Management and Talent Management Strategies			15 Hours
Knowledge Management Strategy – Process of Knowledge Management – Sources and Types of Knowledge – Approaches to the development of Knowledge Management Strategies – Components of Knowledge Management Strategy – Issues in Strategic Knowledge Management.				
Talent Management – Process of Talent Management – Developing a Talent Management Strategy.				
Books for Study:				
1. Michael Armstrong, Strategic Human Resource Management – A Guide to Action, Kogan Page Limited, London.				
2. S.S.Khanka, Human Resource Management – Text and Cases, S.Chand & Co. Pvt. Ltd., New Delhi.				
3. H K. Sundar & J. Srinivasan, Human Resource Development, Margham Publications, Chennai..				
Books for Reference:				
1. K. Sundar & J. Srinivasan, Essentials of Human Resource Management, Vijay Nicole Imprints Pvt. Ltd., Chennai.				
2. Mello Jeffrey A, Strategic Human Resource Management, Thomson, India.				
3. Michael & Baron Angela, Handbook of Strategic HRM, Armstrong, Jaico Publishing House, New Delhi.				

4. **E Mohan Thite, Routledge**, HRM – Digital Approaches, Directions and Applications, New York
5. **Agarwala T**, Strategic Human Resource Management, Oxford University Press, New Delhi.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Distinguish between HRM and SHRM.	K2, K3
CO2	Explain the features of Strategic HRM and Use Effective HR Strategies.	K1, K3
CO3	Summarize Employee Resourcing Strategy.	K2,
CO4	Examine the content of Reward Strategy and Prioritize the components of High Performance Working System.	K5
CO5	Appraise the significance of knowledge management, talent management and stress management. Evaluate Talent Management Strategies.	K5
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓			✓		✓
CO2		✓	✓	✓		✓		✓
CO3		✓	✓	✓		✓		✓
CO4	✓	✓	✓	✓		✓		✓
CO5		✓	✓	✓		✓		✓
Number of matches = 25 , Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO2002	DSC	ADVANCED FINANCIAL MANAGEMENT	6	5
Course Objectives				
1. To develop in depth understanding of the concept of financial management. 2. To make the students understand fund management, cost of capital and capital structure. 3. To familiarise with working capital management, dividend policy and capital budgeting technique.				
Unit–I	Introduction			18 Hours
Financial Management – Scope – Objectives – Significance – Profit Maximisation Vs Wealth Maximisation – Finance Function – Role of Financial Manager – Methods and Tools of Financial Management – Time value of money – Methods of Analysis – Compounding: Compounding of interest over ‘n’ year, Multiple Compounding periods, Effective rate of Interest, Doubling period, Compound value of a series of payments, Compound value of an annuity.				
Unit–II	Sources of Finance			18 Hours
Long– term sources – Shares – Debentures – Convertible securities – Short–Term Sources – Working Capital Financing – Sources and Approaches – Bank Credit – Basic principles and methods of assessment – Other sources of Short–Term Finance – Operating Environment of working capital.				
Unit–III	Cost of Capital and Capital Structure			18 Hours
Concept – Cost of equity, Cost of debenture, Cost of preference share capital, Cost of retained earning – Weighted Average cost of capital (WACC) – Determinants of cost of capital – Capital Structure theories – Net Income approach (NI), Net Operating Income approach (NOI), Modigliani and Millar approach (MM) and Traditional approach – Factors Influencing capital structure – Leverage – Types – Operating Leverage (OL) – Degree of Operating Leverage (DOL) – Financial Leverage (FL) – Degree of Financial Leverage (DFL) – Combined Leverage.				
Unit–IV	Working Capital Management and Dividend Policy			18 Hours
Working capital – Concept – Types – Significance –Sources of working capital – Determinants of working capital requirements – Forecasting of Working Capital Requirements – Dividend – Types of Dividends – Objectives of Dividend policy – Nature of dividend policy – Factors determining dividend policy – Dividend theories – Theories of relevance: Walter’s Model, Gordon’s Model – Theories of irrelevance: Modigliani – Millar Model.				
Unit–V	Capital Budgeting			18 Hours
Capital Budgeting – Features – Objectives – Need and Significance of Capital Budgeting – Capital Budgeting Process – Evaluation of Capital Budgeting Proposals – Traditional or Non–discounting Methods - Pay Back Period Method - Accounting or Average Rate of Return (ARR) Method – Discounted Cash Flow or Time Adjusted Methods - Net Present Value (NPV) Method - Internal Rate of Return (IRR) Method - Profitability Index (PI) Method.				

Books for Study:

1. **I.M.Pandey**, Financial Management, Vikas Publishing House, New Delhi.
2. **M.Y.Khan and P.K.Jain**, Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.
3. **S.N. Maheswari**, Fundamentals of Financial Management, Sultan Chand & Sons, New Delhi

Books for Reference:

1. **Prasanna Chandra**, Financial Management Theory and Practices, Tata McGraw Hill Publishing Company, New Delhi.
2. **R.P.Rustagi**, Fundamentals of Financial Management, Taxmann, New Delhi.
3. **Sharma, S.K. and SareenRachan**, Fundamentals of Financial management, Sultan Chand & Sons (P) Ltd, New Delhi.
4. **R.Kothari**, Financial Management: A Contemporary Approach, Sage Publication India (P) Ltd, New Delhi.
5. **Songh, Surender and Kaur, Rajeev**, Fundamentals of Financial Management, Scholar Tech Press, New Delhi.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the foundation of financial management, time value of money and role of a finance manager.	K2
CO2	Analysis the long-term sources of fund and determinants of cost of capital	K4
CO3	Knowledge on various capital structure theories and factors affecting capital structure decisions in a firm.	K1
CO4	Understand the details of working capital management and effectively manage cash, receivables and inventories.	K2
CO5	Understand the various theories of dividend and factors affecting dividend policy and evaluate the capital projects.	K5
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓		✓	✓	✓
CO2	✓		✓	✓	✓		✓	✓
CO3		✓		✓	✓	✓	✓	✓
CO4		✓	✓	✓	✓			✓
CO5			✓	✓	✓	✓	✓	✓
Number of matches =29, Correlation: Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO2003	DSC	RESOURCE MANAGEMENT TECHNIQUES	6	4
Course Objectives				
1. To educate students about the Quantitative techniques. 2. To understand and solve LPP including Transportation and Assignment Problems. 3. To Apply Decision Theory, Game theory, Sequencing and Network Analysis Techniques in Business Decision making.				
Unit–I	Introduction			18 Hours
Resource Management Techniques – Operations Research for Management of Resources – Definition – Objective – Nature – Phases – Models – Role in Business Decision–Making – Limitations.				
Unit–II	LPP			18 Hours
Linear Programming Problem: Meaning – Concept – Steps – Components – Characteristics – Linear Programming Problems: Graphical Method – Simplex Method – Big ‘M’ Method.				
Unit–III	Transportation & Assignment Problems			18 Hours
Transportation Problem: Meaning – Balanced and Unbalanced Problems – Obtaining IBFS using Vogel’s Approximation Method – Optimality Test – Optimal Solution using Modified Distribution method. Assignment Problem: Definition – Steps involved in solving Assignment Problem by Hungarian Method – Balanced Assignment Problem – Unbalanced Assignment Problem				
Unit–IV	Decision Theory & Game Theory			18 Hours
Decision Theory – Steps – Environment – Optimal Decisions. Theory of Games: Introduction – Problems and Solutions to games: Saddle Point – Dominance Rule – Mixed Strategy – Graphical Method.				
Unit–V	Scheduling Tasks			18 Hours
Sequencing – Definition – Terms and Notations – Principal Assumptions – Types: Problems with n Jobs through 2 Machines – Problems with n jobs through 3 Machines. Network Analysis – Concepts – Rules for plotting network diagrams – CPM Computations: EST – EFT – LFT – LST – TF – Finding Critical Path. PERT: Meaning – Steps Involved – Optimistic Time – Pessimistic Time – Most Likely Time – Estimation of Variability of Activity Times.				
Books for Study:				
1. V. Sundaresan et. al., Resource Management Techniques, AR Publications 2. Dr. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi. 3. C.R. Kothari, Quantitative Techniques, Vikas Publishing				
Books for Reference:				
1. Hamdy A. Taha, Operations Research: An Introduction, Pearson Education India. 2. N.D. Vohra, Quantitative Techniques in Management, McGraw Hill Education. 3. P.C. Tulsian & Vishal Pandey, Quantitative Techniques: Theory & Problems, Pearson Education, New Delhi 4. Kanti Swarup et. al., Operations Research, Sultan Chand & Sons				

5. Nagaraj Balakrishnan et. al., Managerial Decision Modeling with Spreadsheets, Pearson

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments on problems

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Describe role of Quantitative techniques in business and classify them.	K2
CO2	Formulate LPP and solve it using Graphical, Simplex and Big 'M' methods.	K3, K4, K5
CO3	Solve Transportation and Assignment problems.	K3, K4, K5
CO4	Apply concepts and theories of Decision Theory and Game Theory in framing Competitive Strategies.	K3, K4, K5
CO5	Utilise Sequencing & Network Analysis to reduce time in Business Decision making	K3, K4, K5
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1			✓			✓		✓
CO2	✓	✓	✓			✓	✓	✓
CO3	✓	✓	✓			✓	✓	✓
CO4	✓	✓	✓			✓	✓	✓
CO5	✓	✓	✓				✓	✓
Number of matches =26, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCO2004	DSC	BUSINESS ENVIRONMENT	5	4
Course Objectives				
1. To enable the students to have an overview of various factors influencing business and its prosperity. 2. To acquaint the students to economic environment, LPG system and social responsibility and New Economic Policy and New Industrial Policy 3. To comprehend theoretical foundations of International Business Environment and get the students acquainted with Directive and recent trends in Technological Environment.				
Unit-I	Introduction			15 Hours
Business Environment – Concept – Nature – Significance – Types of Environment – Internal and External – Micro and Macro – Changing Dimensions of Business Environment – Environmental Scanning and Monitoring – Techniques – Environmental Forecasting – Types – Techniques.				
Unit-II	Economic Environment			15 Hours
Economic Environment – Significance – Economic System – Types – Economic Planning – Functions of NITI Aayog – Government Policies – Major Economic Reforms – LPG – New Economic Policy – New Industrial Policy.				
Unit-III	Social & Cultural Environment			15 Hours
Concept of Society – Business & Society – Types of Social Groups – Impact of Religious and Linguistic Groups on Business – CSR towards various stakeholders of business – Culture – Features – Elements – Sub-Culture – Cross-Culture – Impact of Culture on Business.				
Unit-IV	Political & Technological Environment			15 Hours
Institutions of Political System – Types of Political Systems – Directive Principles – Ease of doing Business – Objectives of State intervention in Business – Nationalisation – Privatization & Disinvestment – Technological Environment – Factors – Role and Impact of Technology on Business – Transfer of Technology – Channels – Methods and Limitations.				
Unit-V	Legal & Global Environment			15 Hours
Legal Environment – Impact on Business – International Arbitration – Globalisation – Features – Essential Conditions for Globalisation – Pros and Cons of Globalisation – Free trade – Free Port – Foreign Market Entry Strategies.				
Books for Study:				
1. Francis Cherunilam, Business Environment, Himalaya Publications, Mumbai. 2. Sankaran, Business Environment, Margham Publication, Chennai 3. Shaikh, Business Environment, Pearson Education, New Delhi				
Books for Reference:				
1. Aswathappa, K. Essentials of Business Environment: Himalaya Publishing house, New Delhi 2. Shajahan, International Business, Mac MilanIndia, New Delhi. 3. P.K.Gosh & G.K. Kapoor, Business Policy and Environment, Sultan Chand and Sons,				

New Delhi.

4. **Bedi, Suresh**, Business Environment, Excel Books, New Delhi.

5. **Sheikh Saleem**, Business Environment, Pearson Education, New Delhi.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explain the concepts of Business Environment	K1
CO2	Understand the Economic Environment and LPG system	K2
CO3	Analyse Political and Labour Environment affects the functioning of business and delineate New Economic Policy and Industrial Policy	K4
CO4	Describe the Impact of Social and Cultural Environment on Business	K1
CO5	Comprehend the International Environment of Business and International Economic Institutions	K4
K1- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓		✓		✓
CO2	✓	✓	✓	✓		✓		
CO3	✓	✓	✓	✓		✓		
CO4	✓	✓	✓	✓				
CO5	✓	✓	✓	✓			✓	
Number of matches = 25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE21	DSEC	INTERNATIONAL BUSINESS	6	4
Course Objectives				
1. To acquaint on the concept of International Business and International Trade Policy.				
2. To enlighten Balance of Payment and International Economic Integration.				
3. To understand the functionality of International Economic Institutions, WTO and MNCs.				
Unit-I	Introduction to International Business			18 Hours
Concept of Flattening World – Competitive Dimensions – Scope and Importance of International Business – Globalisation and its Drivers – Modes of Entry into International Business – International Business Strategy– Emerging Issues in International Business – Global Outsourcing				
Unit-II	International Trade Policy & Investment			18 Hours
Theories of International Trade – Government Intervention in International Trade – Tariff and Non-Tariff Barriers – TRIPS and TRIMS – India’s Foreign Trade Policy – Foreign Direct Investment (FDI) – Foreign Institutional Investors (FIIs) – Foreign Portfolio Investment (FPI) – Types of FDI – Trends in FDI – India’s FDI Policy – Crptocurrency – Euro Currency.				
Unit-III	Balance of Payment and International Economic Integration			18Hours
Balance of Payment (BOP) – Importance – Components of BOP – Regional Economic Integration – Level of Regional Economic Integration – Regional Trade Agreements – Commonwealth – G20 – Quad – European Union (EU), ASEAN, APEC, SAARC, NAFTA, CAFTA– UNCTAD.				
Unit-IV	International Economic Institutions			18 Hours
GATT – International Monetary Fund (IMF) – World Bank – World Trade Organisation (WTO) – Functions and Objectives of WTO – Asian Development Bank – International Finance Corporation (IFS) – United National Industrial Development Organisation (UNIDO) – International Trade Centre (ITC) – World Economic Forum (WEF).				
Unit-V	Multinational and Transnational Corporations			18 Hours
Multinational Corporations (MNCs) – Concept – Dominance of MNCs – Merits and Demerits of MNCs – Role of Multinational Corporations in Economic Development –Transnational Corporations (TNCs) – TNCs Vs MNCs – TNC’s and Global Economy.				
Books for Study:				
1. Francis Cherunilam, International Business – Text & Cases PHI Learning Pvt. Ltd., New Delhi.				
2. Kamal Fatehi & Jeongho Choi, International Business Management Springer Nature, Switzerland.				
3. Gabriel Moens and Peter Gillies, International Trade and Business: Law, Policy and Ethics, Caveridish Publishing (Australia) Pty Ltd. Sydney.				
Books for Reference:				
1. Walter Leal Filho, Paulo R. Borges de Brito & Fernanda Frankenberger, International Business, Trade and Institutional Sustainability, Springer Nature, Switzerland.				

2. **Densil A. Williams**, International Business Blunders: Lessons for Future Managers, Emerald Publishing Ltd., Bingley, UK
3. **K. Aswathappa**, International Business, McGraw–Hill Education (India) Pvt. Ltd., New Delhi.
4. **Beth A. Simmons & Richard H. Steinberg**, International Law and International Relations, Cambridge University Press, New York.
5. **Malcolm. N. Shaw**, International Law, Cambridge University Press, New York.

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explain International Business and its Strategies.	K1, K2
CO2	Reframe International Trade Policies and various Foreign Direct Investment	K5
CO3	Articulate Balance of Payment and International Economic Integration	K3
CO4	Illustrate the working of International Economic Institution	K1, K4
CO5	Write functionality of Multinational Corporation and Transactional Corporation	K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓		✓	✓	✓
CO2	✓	✓	✓			✓	✓	✓
CO3	✓	✓	✓				✓	✓
CO4		✓	✓	✓			✓	✓
CO5	✓						✓	
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE22	DSE	EXIM MANAGEMENT	6	4
Course Objectives				
1. To familiarize students with basis concepts and objectives of Export and Import . 2. To equip the Students to know about Export and Import Procedures and Documentation 3. To educate the students about the EXIM Policy, Pricing and Financing				
Unit-I	Introduction to Export & Import			18 Hours
Export – Objectives – Features – Merits & Demerits – Factors Influencing Transition from Domestic to International Business – Role of Export in Economic development –Role of Government Agencies in Promotion of Export – Import – Objectives – Merits & Demerits – Entrepot.				
Unit-II	EXIM Procedures & Documentation			18 Hours
Export procedures – Stages in Export procedure, Shipping and Customs formalities – Invoice – Letter of Credit – Bill of Lading – Shipping Note – Airway Bill – Banking procedure – Import Procedures – Stages in Import & Customs formalities – IceGate.				
Unit-III	EXIM Policy and Export Pricing			18 Hours
EXIM Policy – Objectives – Features – Content of EXIM Policy – Different Modes of EXIM Marketing – Export Pricing – Objectives – Factors influencing Pricing decision – Steps Involved in Pricing – Methods of Payment to Exporter and Importer.				
Unit-IV	Export & Import Financing			18 Hours
Export Financing – Pre-Shipment Finance – Role of Bankers in Export & Import Business – Post-Shipment – Export Advance – ECGC. Import Finance – Types of import finance including LC’s – supplier’s credit – buyer’s credit – Trust Receipt – Term Loan & Cash credit – Provisions relating to sanction – disbursal – quantum – interest rate – repayment – Foreign Currency Loans.				
Unit-V	Promotion Schemes			18 Hours
Export Incentives – Duty Exemptions Schemes – Duty Remission Schemes – Export Promotion Schemes – SEZs –EOUs – Market Development Assistance – Cash Compensatory Scheme – Duty Drawback scheme –Replenishment Licensing Scheme – Duty Exemption Scheme – Conditions warranting Import Promotion – Entrepot Promotion Schemes.				
Books for Study:.				
1. TAS Balagopal, Export Management, Himalaya Publishing House, Mumbai. 2. Gerald Albaum , Edwin Duerr , Alexander Josiassen, International Marketing and Export Management, Pearson 3. Ram Singh, Export and Import Management, SAGE Publications Pvt. Ltd; 1 st edition				
Books for Reference:				
1. B.S.Rathor, Export Management, Himalaya Publishing House, Mumbai 2. Varshney & Bhattacharya, International Marketing, Sultan Chand & Sons, New Delhi. 3. D.C. Kapoor, Export Management,Vikas Publishing House, New Delhi. 4. Handbook of Import-Export Procedures –Ministry of Commerce, Govt. of India. 5. Export Documentation and procedures –Nabhi Publications, New Delhi.				

Methodology of Teaching:**Chalk and Talk, ICT Presentation, Video lectures**

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Gain knowledge on features ,objectives and role of Government in Export and Import.	K1
CO2	Understand the Foreign Trade Policy and Pricing decisions.	K2
CO3	Create the knowledge on Export and Import procedure, formalities and documents.	K6
CO4	Apply the accessibility of various Export and Import financing.	K4
CO5	Enhance the cognitive knowledge of various Export promotion schemes.	K1
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓	✓	✓	✓
CO2	✓		✓	✓	✓		✓	✓
CO3	✓	✓		✓	✓		✓	✓
CO4	✓	✓		✓		✓	✓	✓
CO5		✓	✓	✓	✓		✓	✓
Number of matches =30, Correlation:Very High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCODE23	DSE	SUPPLY CHAIN MANAGEMENT	6	4
Course Objectives				
1. To enable the student to acquire comprehensive understanding of Supply Chain Management 2. To enlighten the students to gain knowledge on Logistics Management 3. To impart knowledge about Supply Chain procedure, Strategies and designing of Supply Chain using Latest Technology.				
Unit-I	Introduction			18 Hours
Supply Chain Management – Evolution – Elements – Types – Importance – Activities – Functions – Barriers – Role of IT in SCM – ERP in SCM – Green SCM – Benefits – Sustainable SCM.				
Unit-II	Sourcing & Procurement			18 Hours
Demand Management – Demand Forecasting – Purchasing – Functions of Purchase Department – Production – Product Design – Mass Customisations – Vendor Selection, Management & Evaluation – Inventory – Inventory Management – Objectives – Inventory Control.				
Unit-III	Logistics & Warehousing			18 Hours
Logistics Management – Inbound & Outbound – Business Logistics – Production Logistics – Logistics Outsourcing – Warehousing – Warehouse Management System – Warehouse Control System – E-logistics .				
Unit-IV	Supply Chain Intermediaries			18 Hours
Supply Chain Intermediaries – Types – Channels of Distribution – Industrial Goods – Consumer Goods – Services – Factors influencing channel decisions – Channel Relationships – Various Approaches to Study Channels – Classification of Middlemen – Merchant Middlemen – Functional Middlemen (Agent Middlemen)				
Unit-V	SCM Integration			18 Hours
Supply Chain Integration – Transportation & Distribution – Control & Strategies – Customer Value – Dimensions – Measures – Contemporary Issues in SCM – Process – People – Technology – International Issues in SCM – Risks – Risk Management				
Books for Study:				
1. Pankaj Madan, Neeraj Anand , Supply Chain Management, Global Academic Publishers & Distributors 2. Christopher, M. , Logistics and Supply Chain Management, Prentice Hall. 3. Chopra Sunil and Peter Meindl : Supply Chain Management, Pearson Education				
Books for Reference:				
1. Donald J Bowersox, David J Closs , Logistical Management, TMH 2. Handfield, Nicholos , Introduction to Supply Chain Management, Pearson 3. Peter Meindl, Sunil Chopr, D.V.Kalra , Supply Chain Management Strategy, Planning				

and Operation, Pearson, India.

4. **N. Chandrasekaran**, Supply Chain Management, Oxford University Press, India.

5. **Richard B. Chase**, Operations and Supply Chain Management, McGraw Hill Education India

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concept of supply chain managements.	K2
CO2	Evaluate Transport Functionality	K5
CO3	Design the Logistics and Supply Chain Management.	K6
CO4	Articulate Strategic Issues in Supply Chain Management.	K3
CO5	Develop knowledge on modern methods of Logistics.	K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓		✓		✓	✓	✓
CO2		✓		✓		✓	✓	✓
CO3		✓		✓		✓	✓	✓
CO4		✓		✓		✓	✓	✓
CO5		✓		✓		✓	✓	✓
Number of matches =25, Correlation: High								

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

**DEPARTMENT OF
MATHEMATICS**

PROGRAMME OUTCOMES

- PO1** Communicate in English, the ideas, findings, and results effectively through Conversations, meetings, and reports, especially through digital means.
Develop
linguistic skills in one Indian/Regional language.
- PO2** Demonstrate knowledge of the concepts, principles, theories, and techniques of the domain and allied subject areas.
- PO3** Synergise knowledge with Analytical& Experimental skills to systematically create & run
programs/carry out experiments/formulate & prove theories to enrich the body of knowledge.
- PO4** Synthesize learned knowledge and acquired skills to Identify and critically analyze pertinent problems in the relevant discipline using appropriate tools and techniques.
- PO5** Exhibit potential to accomplish tasks independently or as a member or leader of a team.
- PO6** Utilize specialized instruments and equipment, Computers, Software, Internet, and other ICT tools to carry out experiments.
- PO7** Demonstrate knowledge and scientific understanding to design experiments, use appropriate methodologies, analyze and interpret data and provide solutions, and Exhibit organizational skills, and the ability to manage time and resources.
- PO8** Create Compounds/Products/Software or Design experiments and/or collaborate to help
Society in building a Sustainable Environment.
- PO9** Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT.
- PO10** Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future.

Program Specific Outcomes (PSOs)

By the end of the program, the students will be able to

PSO1	Develop mathematical ability to think abstractly.
PSO2	Solve skilled problems.
PSO3	Create talents for various types of employment.
PSO4	Equip themselves to appear competitive examinations.
PSO5	Learn independently and improve self performance.
PSO6	Develop in depth knowledge in mathematics appreciating the connection between theory and its applications.
PSO7	Identify the application of mathematics in other discipline and society.
PSO8	Demonstrate the mathematical modelling ability.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes	Programme Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓	✓			✓	✓		✓
PSO2	✓	✓	✓	✓			✓	✓	✓	
PSO3	✓		✓	✓	✓		✓	✓		
PSO4	✓	✓		✓	✓			✓	✓	
PSO5	✓		✓	✓		✓	✓	✓	✓	
PSO6		✓	✓	✓	✓		✓	✓	✓	
PSO7		✓	✓	✓				✓	✓	✓
PSO8		✓	✓			✓	✓	✓	✓	✓
Number of Matches = 53, Correlation : High										

Mapping Correlation Benchmark

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMS1001	DSC1	ALGEBRA AND CALCULUS	3	3

Course Objectives

Students are exposed to topics like Theory of Equations, Summation of Series and the fundamental principles, concepts and knowledge in the areas of Differential, Integral Calculus.

UNIT-I	THEORY OF EQUATIONS	9 hours
Polynomial Equations – Imaginary and Irrational roots – Relation between roots and coefficient of equations – Transformations – Reciprocal Equations – Descarte rule of signs. Text Book 1:Volume I: Chapter 6: Sections: 8 – 11, 15, 16, 24		
UNIT-II	SUMMATION OF SERIES	9 hours
Summation of series using Binomial, Exponential and Logarithmic series (Theorems without proof). Text Book 2: Paper- I – Algebra- Sections: 2, 3, 4		
UNIT-III	DIFFERENTIAL CALCULUS	9 hours
Partial Differentiation – Function of function rule – Total differential coefficient – Homogeneous functions (Euler's theorem) – Maxima and Minima functions of two independent variable. Text Book 3: Chapter VIII: Sections 1.1, 1.2, 1.3, 1.6, 4		
UNIT-IV	INTEGRAL CALCULUS	9 hours
Integration by Parts – Reduction formula – Bernoulli's formula. Text Book 4:Chapter I: Sections 12, 13, 14, 15.1		
UNIT-V	INTEGRAL CALCULUS	9 hours
Beta and Gamma functions : Definitions – Convergence of $\Gamma(n)$ – Recurrence formula of Gamma functions – Properties of Beta functions – Relation between Gamma and Beta functions – Examples. Text Book 4: Chapter VII: Sections 2.1-2.3, 3, 4, 5		

UBMS1001 - ALGEBRA AND CALCULUS

Books for Study: (Text Books)

1. T.K. Manickavachagom Pillay, T. Natarajan and K. S. Ganapathy, ALGEBRA Vol. – I, II (2007), S. Viswanathan Printers & Publishers Pvt. Ltd, Chennai.
2. P. Kandasamy and K. Thilagavathy, MATHEMATICS FOR B.SC. Vol. – I (2004), S. Chand & Company Ltd, New Delhi.
3. S. Narayanan and T.K. Manickavachagom Pillay, CALCULUS, Volume – I (2017), S. Viswanathan Printers & Publishers, Chennai.
4. S. Narayanan and T.K. Manickavachagom Pillay, CALCULUS, Volume – II (2017), S. Viswanathan Printers & Publishers, Chennai.

Books for Reference:

1. S. Arumugam, ALGEBRA (2003), New Gamma Publishing House.
2. P.R. Vittal, MATHEMATICAL FOUNDATIONS, Margham Publication, Chennai.
3. Shanti Narayan, DIFFERENTIAL CALCULUS,(2001), S. Chand & Co., New Delhi.
4. G.B. Thomas and R.L. Finney, CALCULUS AND ANALYTICAL GEOMETRY, (1998), Addison Wesley (9th Edition).

UBMS1001 - ALGEBRA AND CALCULUS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve the polynomial equation.	K3
CO2	Identify the series.	K1
CO3	Analyze functions of two variables, continuity and differentiability	K4
CO4	Apply the reduction formula to evaluate the integrals.	K3
CO5	Discuss the relation between Beta and Gamma functions.	K2
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (Cos)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓		✓	✓		✓
CO3		✓	✓		✓	✓		✓
CO4	✓		✓	✓	✓		✓	✓
CO5	✓	✓		✓		✓	✓	
Number of matches = 29, Correlation : High								

Prepared by		Verified by	
	Dr. S.N. MOHAMED ASSARUDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
	DSC1	MATHEMATICAL COMPUTATIONS - LAB	3	

Course Objectives

This course is to practice mathematics in software.

List of Exercises

1. Finding the roots of polynomial equations and system of equations
2. Testing consistency of system of equations
3. Finding sum of infinite series
4. Successive Differentiation of single variable functions.
5. Partial derivatives
6. Finding Maxima and Minima

Books for Study:

1. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010
Chapters 1 to 8 (Book Freely Downloadable in Internet)
2. Plotting Using Scilab – Anopen Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, Stephen L. Campbell, Jean-Philippe Chancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

<http://ndl.iitkgp.ac.in>
<http://ocw.mit.edu>
<http://mathforum.org>

MATHEMATICAL COMPUTATIONS LAB – I

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's .	K3
CO2	Understand the knowledge of application of Mathematics	K2
CO3	Perform the successive differentiation.	K6
CO4	Understand the partial derivatives.	K2
CO5	Calculate maxima and minima for the functions of two variables.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓		✓	✓	✓
CO2		✓		✓		✓	✓	✓
CO3	✓		✓		✓	✓		✓
CO4	✓	✓		✓	✓		✓	
CO5		✓	✓		✓	✓		✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. S.N. MOHAMED ASSARUDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

Common to UG – Mathematics, Physics and Chemistry

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBSKB101	SEC1	PROFESSIONAL COMMUNICATION FOR PHYSICAL SCIENCES	3	3

Course Objectives

The aim of the course is to develop the language skills by sharpening the critical thinking of the students.

UNIT-I	COMMUNICATION	9 hours
Listening: Listening to audio text and answering questions a. Listening to Instructions Speaking: Pair work and small group work. Reading: Comprehension passages – Differentiate between facts and opinion Writing: Developing a story with pictures. Vocabulary: Register specific – Incorporated into the LSRW tasks (Omit: Speaking: Source Passage 2 – the invention of Saccharine. Page 19 Reading: Source Passage 3 – Marie curie (1867 – 1934). Page 33 Writing: Source Passage 3 –Boolean Algebra.) Page 44		
UNIT-II	DESCRIPTION	9 hours
Listening: Listening to process description – Drawing a flowchart. Speaking: Role play(formal context) Reading: Skimming/Scanning – Reading passages on products, equipment and gadgets. Writing: Process Description–Compare and Contrast Paragraph – Sentence Definition and Extended definition – Free Writing. Vocabulary: Register specific – Incorporated into the LSRW tasks. (Omit:Source Passage IV – Applied Number theory in ATM.) Page 60		
UNIT-III	NEGOTIATION STRATEGIES	9 hours
Listening: Listening to interviews of specialists / Inventors in fields (Subject specific) Speaking: Brain storming (Mind mapping). Small group discussions (Subject-Specific) Reading: Longer Reading text.		

Writing: Essay Writing(250words)

UBSKB101 - PROFESSIONAL COMMUNICATION

Vocabulary: Register specific – Incorporated into the LSRW tasks

(**Omit:** Source Passage V – Biomass and Bio fuels.) Page 86

UNIT-IV PRESENTATION SKILLS

9 hours

Listening: Listening to lectures.

Speaking: Short talks.

Reading: Reading Comprehension passages

Writing: Writing Recommendations Interpreting Visuals inputs

Vocabulary: Register specific – Incorporated in to the LSRW tasks

(**Omit:** Source Passage V -The invincible II and (Page 101)

Source Passage VI – History of Ratio.) (Page 105)

UNIT-V CRITICAL THINKING SKILLS

9 hours

Listening: Listening comprehension – Listening for information.

Speaking: Making presentations(with PPT – practice).

Reading: Comprehension passages–Note making.

Comprehension: Motivational article on Professional Competence,
Professional Ethics and Life Skills)

Writing: Problem and Solution essay–Creative writing–Summary writing

Vocabulary: Register specific – Incorporated into the LSRW tasks

(**Omit :**Source passage IV – Does 5G pose health risk (Page 124)

Books for Study:

English for Physical Sciences by Tamil Nadu State Council for Higher Education (TANSCH), (2020), Govt. of Tamil Nadu

UBSKB101 - PROFESSIONAL COMMUNICATION

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Attempt the English language for speaking and writing with confidence.	K1
CO2	Understand the importance of listening and reading.	K2
CO3	Focus the independently reading capacity.	K4
CO4	Write simple and compound sentences without errors.	K3
CO5	Develop the strategic competence in developing the efficient communication.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓	✓		✓	✓
CO2		✓	✓	✓		✓		✓
CO3	✓		✓		✓	✓	✓	
CO4		✓		✓	✓	✓	✓	✓
CO5	✓	✓	✓		✓			✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. S. SOUNDARARAJAN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMSAL11	OEC1	ALLIED - NUMERICAL APPROXIMATIONS – I	5	5

Course Objectives

This course covers the basic method for forming difference table, essence of interpolation techniques, solving algebraic equations and system of linear equations.

UNIT–I	FINITE DIFFERENCES AND OPERATORS	15 hours
First and Higher order differences – Forward and Backward operators – Properties of operators – Differences of a Polynomial – Factorial Polynomial – Operator E – Relation between Δ , ∇ and E. Chapter 3: Pages 70 – 93		
UNIT–II	INTERPOLATION FOR EQUAL INTERVALS	15 hours
Newton Gregory Forward and Backward interpolation formulae – Guass forward and backward difference formulae – Stirling's formula – Bessel's formula – Problems based on them. Chapter 4 and 5 : Pages 109 – 142		
UNIT–III	INTERPOLATION WITH UNEQUAL INTERVALS	15 hours
Divided differences – Newton's divided differences formula – Lagrange's formula – Estimating the missing terms. (with one or two missing values). Chapter 6: Pages 157 – 175		
UNIT–IV	INVERSE INTERPOLATION	15 hours
Lagrange's method and Reversion of Series Method (Using Newton's forward formula only) – Summation of series – Sum to n terms of the series whose general term is the first difference of a function. Chapter 6 : Pages : 176 – 184 Chapter 1 : Pages 98 – 107		
UNIT–V	SOLUTIONS OF SMULTANIOUS LINEAR EQUATIONS	15 hours
Guass Elimination method – Guass Jordon method – Gauss Jacobi Method - Gauss Seidal Method. (upto three unknowns only) Chapter 2 : Pages 36 – 45 and Pages 55 – 60		

Books for Study:

P. Kandasamy and K. Thilagavathy, CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS (2003), S. Chand & Co Ltd., New Delhi.

Books for Reference:

1. H.C. Saxena, FINITE DIFFERENCES AND NUMERICAL ANALYSIS (1991), S. Chand & Co Ltd., New Delhi.
2. S. Arumugham, NUMERICAL METHODS (2003), New Gamma Publishing, Palamkottai.
3. M.K. Vengataraman, NUMERICAL METHODS FOR SCIENCE AND ENGINEERING (1992), National Publishing Company, Chennai.

UBMSAL12 - NUMERICAL APPROXIMATIONS – I

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concepts of finite difference operators.	K2
CO2	Find the interpolation of equal intervals.	K5
CO3	Analyze the concept of interpolation of unequal intervals.	K4
CO4	Apply various interpolating and extrapolating methods to find numerical solution.	K3
CO5	Manage for finding solution of simultaneous linear equations.	K1
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓	✓	✓	✓
CO2		✓	✓	✓	✓		✓	
CO3	✓	✓	✓	✓		✓		✓
CO4	✓	✓		✓			✓	✓
CO5		✓	✓		✓	✓	✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. SYED TAHIR HUSSAINY		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
	OEC	NUMERICAL COMPUTATIONS - LAB	3	

Course Objectives

This course is to practice mathematics in software.

List of Exercises

1. Computing expressions
2. Operations on Vectors
3. Operations on Sets
4. Permutation and Combinations
5. Polynomial Interpolation.
6. Matrix Manipulation.

Books for Study:

1. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010
Chapters 1 to 8.
2. Plotting Using Scilab – Anopen Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, StephenL. Campbell, Jean-PhilippeChancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

<http://ndl.iitkgp.ac.in>
<http://ocw.mit.edu>
<http://mathforum.org>

NUMERICAL COMPUTATIONS LAB

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's.	K3
CO2	Understand the knowledge of application of mathematics.	K2
CO3	Understand the concept of set theory.	K2
CO4	Compute permutation and combinations.	K3
CO5	Analyse polynomial interpolations.	K4
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓		✓	✓	✓
CO2		✓	✓		✓	✓		✓
CO3	✓			✓			✓	
CO4		✓	✓		✓	✓		✓
CO5	✓		✓	✓	✓	✓	✓	✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. ZAHIRUDDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMS2001	DSC2	GEOMETRY & TRIGONOMETRY	6	6

Course Objectives

The course introduces the fundamental concepts and principles of trigonometric functions. Further the student will apply the concepts of 2D and 3D geometry in real life problem

UNIT-I	EXPANSIONS	18 hours
Expansions of $\sin n\theta$ and $\cos n\theta$ – Expansion of $\tan n\theta$ in terms of $\tan \theta$ – Powers of Sines and Cosines of θ in terms of functions of multiples of θ – Expansions of $\sin^n \theta$, $\cos^n \theta$ in a series of ascending powers of θ Text Book 1: Chapter 3		
UNIT-II	HYPERBOLIC AND INVERSE HYPERBOLIC FUNCTIONS	18 hours
Definition – Relations between Hyperbolic functions and Circular functions – Inverse Hyperbolic functions. Text Book 1: Chapter 4		
UNIT-III	PLANE AND STRAIGHT LINE	18 hours
The Plane : Several forms – The equation of the plane passing through the points $(x_1, y_1, z_1), (x_2, y_2, z_2), (x_3, y_3, z_3)$ – Direction cosines of the line which is perpendicular to the plane – Angle between planes – Equation of a plane through the line of intersection of two given planes – Length of perpendicular – Symmetrical form of the equations of a line – Equation of a straight line passing through two given points – The plane and the straight line : The condition for the line to be parallel to the plane – Angle between planes and line – Coplanar lines – The shortest distance between two given lines. Text Book 2: Chapter II: Sections 4, 5, 6, 7, 9, 10 Chapter III : Sections 2, 4, 5, 6, 7, 8		
UNIT-IV	SPHERE	18 hours
Sphere: Equation – The plane section of a sphere is a circle – Equation of a circle on a sphere – Intersection of two sphere is a circle – Tangent plane– Orthogonal Spheres. Text Book 2: Chapter IV: Sections 3, 5, 6, 7, 8		

UBMS2001 – GEOMETRY & TRIGONOMETRY

UNIT-V	CONE & CYLINDER	18 hours
Cone : Equation of cone – Right circular cone– Intersection of a straight line and a quadric cone – Tangent Plane and normal – Cylinder.		
Text Book 2: Chapter V: Sections 2, 2.1,3,4, 8		
Books for Study: (Text Books)		
1. S. Narayanan and T.K. Manickavachagom Pillay, TRIGONOMETRY (2004), S.Viswanathan Printers & Publishers Pvt. Ltd, Chennai. 2. T.K. Manickavachagom Pillay & others, ANALYTICAL GEOMETRY, Part II – THREE DIMENSIONS, (2009), S. Viswanathan Printers & Publishers, Chennai.		
Books for Reference:		
1. A. Singaravelu, Algebra and Trigonometry, Vol – I & II, Meenakshi Agency, Chennai. 2. P. Duraipandiyan and Laxmi Duraipandiyan, ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS), Asia Publishing Company. 3. P. Kandasamy and K. Thilagavathy, MATHEMATICS FOR B.SC. Vol. I, II, III & IV (2004), S. Chand & Co., Ltd, New Delhi.		

UBMS2001 – GEOMETRY & TRIGONOMETRY

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Express the expansion in terms of sine and cosine powers.	K2
CO2	Understand the hyperbolic and inverse hyperbolic functions.	K2
CO3	Visualize the lines and planes in Three Dimension.	K1
CO4	Analyze the equation of Spheres.	K4
CO5	Focus the equation of cone and cylinder.	K4
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓		✓	✓	✓
CO2		✓		✓	✓		✓	✓
CO3	✓	✓	✓			✓		
CO4	✓	✓		✓	✓		✓	✓
CO5	✓		✓		✓	✓	✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. S.N. MOHAMED ASSARUDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMSPR21	DSC3	MATHEMATICAL COMPUTATIONS - LAB	3	3

Course Objectives

This course is to practice mathematics in software.

List of Exercises

1. Integration of single variable functions.
2. Double Integration
3. Triple Integration
4. Finding Radius of curvature.
5. Visualization of functions in 2D.
6. Visualization of three dimensional mathematical objects.

Books for Study:

1. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010
Chapters 1 to 8 (Book Freely Downloadable in Internet)
2. Plotting Using Scilab – Anopen Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, Stephen L. Campbell, Jean-Philippe Chancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

<http://ndl.iitkgp.ac.in>
<http://ocw.mit.edu>
<http://mathforum.org>

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's .	K3
CO2	Understand the knowledge of application of Mathematics	K2
CO3	Understand the concepts of integration.	K2
CO4	Calculate the radius of curvature.	K3
CO5	Visualize the 2D & 3D functions.	K1
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓		✓		✓
CO2		✓		✓		✓		✓
CO3	✓		✓	✓	✓		✓	
CO4	✓	✓	✓		✓	✓	✓	✓
CO5		✓		✓	✓		✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. S.N. MOHAMED ASSARUDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMSAL21	OEC2	ALLIED - NUMERICAL APPROXIMATIONS – II	5	5

Course Objectives

This course will cover advanced methods for numerical differentiation, numerical integration and numerical solution of ordinary differential equations.

UNIT–I	NUMERICAL DIFFERENTIATION	15 hours
Newton's forward and backward differences to compute the derivatives – Derivative using divided difference formula – Maxima and Minima using the above formulae. Chapter 7: Pages 187-204		
UNIT–II	NUMERICAL INTEGRATION	15 hours
General Quadrature formula – Trapezoidal rule – Simpson's 1/3 rd rule – Simpson's 3/8 th rule – Weddle's rule. Chapter 7: Pages 205-212		
UNIT–III	DIFFERENCE EQUATIONS	15 hours
Linear difference equations – Linear homogeneous difference equation with constants coefficient – Particular integrals of the form a^x , $x^m \sin ax$, $x^m \cos ax$. Chapter 8: Pages 236-261		
UNIT–IV	SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS	15 hours
Bisection method – Iteration method – Regulafalsi method – Newton Raphson's method. Chapter 1:Pages 1-29.		
UNIT–V	NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS	15 hours
Euler's method – Modified Euler's method – Picard's method – Taylor's method – Runge Kutta methods. Chapter 9:Pages 266-300		

Books for Study:

P. Kandasamy and K. Thilagavathy, CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS, (2003), S. Chand & Co Ltd., New Delhi.

Books for Reference:

1. H.C. Saxena, FINITE DIFFERENCES AND NUMERICAL ANALYSIS (1991), S. Chand & Co Ltd., New Delhi.
2. B.D. Gupta, NUMERICAL ANALYSIS, (2001), Konark Pub. Ltd., Delhi.
3. Gupta-Malik, CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS, Krishba Prakashan Mandir, Meerut Seventh Edition.

UBMSAL21 – NUMERICAL APPROXIMATIONS – II

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concept of numerical differentiation.	K2
CO2	Define various integration formulae.	K1
CO3	Solve the difference equation	K3
CO4	Analyze the numerical solution to algebraic and transcendental equation.	K4
CO5	Find the numerical solution of ODE by various methods.	K4
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓		✓		✓
CO2		✓	✓		✓		✓	✓
CO3	✓	✓		✓	✓	✓	✓	
CO4		✓	✓		✓			✓
CO5	✓	✓		✓		✓	✓	✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. SYED TAHIR HUSSAINY		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBMSAP21	OEC3	NUMERICAL COMPUTATIONS - LAB	3	3

Course Objectives

The aim of this course is to practice mathematics in software.

List of Exercises

1. Numerical Differentiation – Forward differences.
2. Numerical Differentiation – Backward differences.
3. Numerical Integration – Trapezoidal Rule.
4. Numerical Integration – Simpson's Rules.
5. Applications of Integration to Area and volume.
6. Numerical Solutions to Ordinary Differential Equations.

Books for Study:

1. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010.
2. Plotting Using Scilab – An open Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, StephenL. Campbell, Jean-PhilippeChancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

<http://ndl.iitkgp.ac.in>
<http://ocw.mit.edu>
<http://mathforum.org>

UBMSAP21 – NUMERICAL COMPUTATIONS LAB

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's .	K3
CO2	Understand the knowledge of application of Mathematics	K2
CO3	Find the numerical solution of ODE.	K5
CO4	Analyse the consistency of system of equations.	K4
CO5	Evaluate the area and volume using integrals.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓		✓		✓
CO2		✓	✓		✓		✓	✓
CO3	✓		✓	✓		✓		✓
CO4	✓	✓		✓	✓		✓	
CO5	✓		✓		✓	✓	✓	✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. ZAHIRUDDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBCCAL12	OEC 1	MATHEMATICAL FOUNDATIONS - I	5	5

Course Objectives

To Explore the Fundamental Concept of Mathematics

UNIT-I	SYMBOLIC LOGIC	15 hours
Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi – conditional operators, converse, inverse, contra positive, logically equivalent, tautology and contradiction, Arguments and validity of argument. Chapter 1: Sections 1.1 – 1.5		
UNIT-II	SET THEORY	15 hours
Set, Set operations, Venn diagram, Properties of sets, number of elements in a set, Cartesian product, relation & functions, Relation : Equivalence relation. Equivalence class, Partially and Totally ordered sets, Functions : Types of Functions, Composition of Functions. Chapter 2: Sections 2.1 – 2.8		
UNIT-III	BINARY OPERATORS	15 hours
Types of Binary operations: Commutative, Associative, Distributive and identity, Boolean algebra: properties, Permutations and combinations. Chapter 3: Sections 3.1 – 3.3		
UNIT-IV	DIFFERENTIATION	15 hours
Simple problem using standard limits, $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$, $\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{x \rightarrow 0} \frac{\tan x}{x}$, $\lim_{x \rightarrow 0} e^x$, $\lim_{n \rightarrow 0} (1 + n)^{\frac{1}{n}}$, Differentiation, successive differentiation, Leibnitz theorem, partial differentiation Applications of differentiation, Tangent and normal, angle between two curves, Maximum and minimum values [second derivative test], curvature and radius of curvature [Cartesian coordinates], Envelops. Chapter 4: Sections 4.1 – 4.9		

UBCCAL11 – MATHEMATICAL FOUNDATIONS I

UNIT–V	TWO DIMENSIONAL ANALYTICAL GEOMETRY	15 hours
Straight lines – pair of straight lines – circles – System of Circles – conics [parabola, Ellipse and Hyperbola]. Chapter 5: Sections 5.1 – 5.5		
Books for Study: U. Rizwan, MATHEMATICAL FOUNDATIONS Volume – I & II, Garuda Learning, Chennai. 2017.		
Books for Reference: 1. P.R. Vittal, MATHEMATICAL FOUNDATIONS, Margham Publication, Chennai. 2. V. Sundaram & others, DISCRETE MATHEMATICAL FOUNDATIONS, A.P. Publication, Sirkali 3. P. Duraipandian & Others, ANALYTICAL GEOMETRY OF 2 AND 3 DIMENSIONS, Emerald Publication 1992 Reprint.		

UBCCAL11 – MATHEMATICAL FOUNDATIONS I

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the truth and logical operators.	K2
CO2	Represent the Venn diagrams of set relation and operation.	K2
CO3	Analyze the concept of binary operation using definition and examples.	K4
CO4	Find the standard limits and differentiation from the first principles.	K5
CO5	Apply the concept of straight lines, system of circle and conics in real life problems.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓	✓		✓
CO2		✓		✓	✓	✓	✓	
CO3	✓		✓		✓		✓	✓
CO4	✓	✓		✓	✓	✓	✓	
CO5	✓	✓	✓	✓		✓		✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. B. TOWFEEQ AHMED		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
	OEC1	COMPUTATIONAL MATHEMATICS - PRACTICAL	3	

Course Objectives

The aim of this course is to practice mathematics in software.

List of Exercises

1. Computing expressions
2. Operations on Vectors
3. Operations on Sets
4. Permutation and Combinations
5. Differentiation of single and double variable functions.
6. Partial derivatives

Books for Study:

3. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010.
1. Plotting Using Scilab – An open Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, Stephen L. Campbell, Jean-Philippe Chancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

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<http://ocw.mit.edu>
<http://mathforum.org>

ALLIED – COMPUTATIONAL MATHEMATICS PRACTICAL

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's .	K3
CO2	Understand the knowledge of application of Mathematics in set theory.	K2
CO3	Perform the differentiation.	K6
CO4	Evaluate the differentiation of single and double variables.	K5
CO5	Understand the Partial derivatives.	K2
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓	✓		✓		✓
CO2	✓	✓	✓	✓	✓		✓	✓
CO3			✓			✓	✓	
CO4	✓	✓		✓	✓	✓		✓
CO5	✓		✓		✓	✓	✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. B. TOWFEEQ AHMED		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBCCAL22	OEC2	MATHEMATICAL FOUNDATIONS - II	5	5

Course Objectives

To Explore the Fundamental Concept of Mathematics

UNIT-I	MATRICES – I	15 hours
Multiplication of matrices, singular and Non singular matrices, Adjoint of a Matrix, inverse of a matrix, symmetric and skew symmetric, Hermitian and skew Hermitian, orthogonal and unitary matrices, Rank of a matrix, solution of simultaneous linear equations by [i] Cramer's rule [ii] Matrix inversion Method. (Upto Three equations and Three unknowns) Chapter 1 : Sections 1.1 – 1.8		
UNIT-II	MATRICES – II	15 hours
Tests for consistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley – Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line $y = x$, rotation about the origin through an angle, expansion or compression, shears, translation. Chapter 2 : Sections 2.1 – 2.4		
UNIT-III	INTEGRAL CALCULUS – I	15 hours
Integration simple problem, integration of rational function involving algebraic expressions of the form $\frac{1}{ax^2+bx+c}$, $\frac{1}{\sqrt{ax^2+bx+c}}$, $\sqrt{ax^2+bx+c}$, $\frac{px+q}{ax^2+bx+c}$, $\frac{px+q}{\sqrt{ax^2+bx+c}}$, Integrations using simple substitutions – integration involving trigonometric functions of the form $\frac{1}{a+b\cos x}$, $\frac{1}{a^2\sin^2 x+b^2\cos^2 x}$ – integration by parts. Chapter 3 : Section 3.1		
UNIT-IV	INTEGRAL CALCULUS – II	15 hours
Properties of definite integrals. Reduction formulae for $\int x^n e^{ax} dx$, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int x^m (1-x)^n dx$, Applications of integration for [i] Area under plane curves, [ii] Volume of solid of revolution. Chapter 4 : Sections 4.1 – 4.3		

MATHEMATICAL FOUNDATIONS II

UNIT-V	ANALYTICAL GEOMETRY OF THREE DIMENSIONS	15 hours
Planes, Straight Lines, Spheres and Cones (simple problems only). Chapter 5 : Sections 5.1 – 5.4		
Books for Study: U. Rizwan, MATHEMATICAL FOUNDATIONS Volume – I & II, Garuda Learning, Chennai. 2017		
Books for Reference: 1. P.R. Vittal, MATHEMATICAL FOUNDATIONS, Margham Publication, Chennai. 2. V.Sundaram & others, DISCRETE MATHEMATICAL FOUNDATIONS, A.P. Publication, Sirkali 3. P. Duraipandian & Others, ANALYTICAL GEOMETRY OF 2 AND 3 DIMENSIONS, Emerald Publication 1992, Reprint.		

MATHEMATICAL FOUNDATIONS II

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Identify diagonal, triangular, symmetric and skew-symmetric matrices.	K1
CO2	Test for consistency of linear equations.	K4
CO3	Evaluate integrals of rational function.	K5
CO4	Perform some application of integral calculus	K6
CO5	Apply the concept of planes, straight, spheres and cones in real life problems.	K2
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓		✓	✓	✓	
CO2		✓		✓	✓	✓	✓	✓
CO3	✓		✓	✓		✓		✓
CO4	✓	✓	✓		✓		✓	✓
CO5		✓		✓	✓	✓	✓	
Number of matches = 28, Correlation : High								

Prepared by		Verified by	
	Dr. B. TOWFEEQ AHMED		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
UBCCAP22	OEC1	COMPUTATIONAL MATHEMATICS - PRACTICAL	3	3

Course Objectives

The aim of this course is to practice mathematics in software.

List of Exercises

1. Matrix Manipulation
2. Testing Consistency of System of Equations
3. Integration of single variable functions
4. Applications of Integration to Area and volume
5. Plotting of 2D objects.
6. Visualization of functions in three dimensions.

Books for Study:

4. Introduction to Scilab, Michael Baudin From Scilab Consortin, 2010.
5. Plotting Using Scilab – An open Source [Document www.openeering.com](http://www.openeering.com)

Books for Reference:

1. Modeling and Simulation in Scilab, Stephen L. Campbell, Jean-Philippe Chancelier and Ramine Nikoukhah.
2. An Introduction to Scilab from a Matlab User's Point of View by Eike Rietsch.
3. Advanced Programming in Scilab, Chetana Jain, Narosa Publishing House, New Delhi.

Source links

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<http://ocw.mit.edu>
<http://mathforum.org>

ALLIED – COMPUTATIONAL MATHEMATICS PRACTICAL

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Solve Mathematical Problems using Mathematical software's .	K3
CO2	Understand the knowledge of application in Mathematics.	K2
CO3	Build their self confidence.	K3
CO4	Evaluate integrals.	K5
CO5	Visualize the 2D and 3D objects.	K1
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓		✓	✓	✓
CO2	✓		✓		✓			✓
CO3	✓	✓		✓		✓	✓	
CO4		✓	✓		✓		✓	✓
CO5	✓	✓		✓	✓	✓		✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. B. TOWFEEQ AHMED		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

PROGRAMME OUTCOMES

- PO11** Demonstrate knowledge and scientific understanding to identify research problems, design experiments, use appropriate methodologies, analyze and interpret data and provide solutions, and Exhibit organizational skills, and the ability to manage time and resources.
- PO12** Demonstrate knowledge of the concepts, principles, theories, and techniques of the domain and allied subject areas.
- PO13** Synergise knowledge with Analytical & Experimental skills to systematically, create & run programs/carry out experiments/ formulate & prove theories to enrich the body of knowledge.
- PO14** Identify and critically analyze pertinent problems in the relevant discipline using appropriate tools and techniques.
- PO15** Exhibit potential to accomplish tasks independently or as a member or leader of a team.
- PO16** Utilize specialized instruments and Equipment, Computers, Software, Internet, and other ICT tools to carry out experiments.
- PO17** Create Compounds/Products/Software or Design experiments and/or collaborate to help Society in building a Sustainable Environment.
- PO18** Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT.
- PO19** Identify the need and importance of Human Rights, especially for Women, Children, Bonded Labourers, and Refugees.
- PO20** Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future.

PROGRAM SPECIFIC OUTCOMES (PSOs)

By the end of the program, the students will be able to

PSO1	Understand in depth knowledge in pure and applied mathematics.
PSO2	Attain the ability to solve challenging problems in Mathematics and prove abstract theorem.
PSO3	Know the specialized area of mathematics and its applications.
PSO4	Analyse practical problems and propose solution.
PSO5	Obtain the exact solutions for the society oriented problems by mathematical models.
PSO6	Discuss in groups or individually in multidisciplinary tasks.
PSO7	Crack the NET / SET examination conducted by UGC-CSIR / NTA or State Universities.
PSO8	Apply the mathematical concepts in real life situations.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓				✓	✓	✓	
PSO2		✓	✓	✓	✓	✓	✓			
PSO3	✓	✓		✓	✓	✓		✓	✓	
PSO4	✓	✓		✓	✓		✓	✓	✓	
PSO5		✓	✓	✓	✓				✓	✓
PSO6	✓	✓		✓	✓	✓		✓	✓	
PSO7		✓	✓		✓	✓	✓	✓		
PSO8		✓	✓			✓	✓	✓	✓	✓
Number of Matches = 52, Correlation : High										

Mapping Correlation Benchmark

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS1001	DSC1	ALGEBRA – I	6	5

Course Objectives

To introduce the concept and to develop working knowledge on class equation, finite groups, linear transformations, real quadratic forms

UNIT–I	ANOTHER COUNTING PRINCIPLE	18 hours
Another counting principle – Class equation for finite groups and its applications – Sylow’s theorems (For theorem 2.12.1 only first proof). Chapter 2 : Sections 2.11 and 2.12 (omit Lemma 2.12.5)		
UNIT–II	DIRECT PRODUCTS AND MODULES	18 hours
Direct products – Finite abelian groups – Modules. Chapter 2 : Sections 2.13 and 2.14 (Theorem 2.14.1 only) Chapter 4 : Section 4.5		
UNIT–III	LINEAR TRANSFORMATIONS	18 hours
Canonical forms – Triangular form – Nilpotent transformations. Chapter 6: Sections 6.4 and 6.5.		
UNIT–IV	CANONICAL FORMS	18 hours
Jordan form –Rational canonical form. Chapter 6: Sections 6.6 and 6.7.		
UNIT–V	TRACE AND TRANSPOSE	18 hours
Trace and transpose –Hermitian, Unitary, Normal transformation. Chapter 6: Sections 6.8, 6.10.		
Books for Study: I.N. Herstein, TOPICS IN ALGEBRA, (Second Edition) (2011), Wiley Eastern Limited, New Delhi.		

PBMS1001 – ALGEBRA – I

Books for Reference:

1. M. Artin, ALGEBRA(1991), Prentice Hall of India.
2. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, BASIC ABSTRACT ALGEBRA(Second Edition)(1997), Cambridge University Press.
3. I.S. Luther and I.B.S. Passi, ALGEBRA, Vol I – Groups, Vol II – Rings(1999),Narosa Publishing House, New Delhi.
4. D.S. Malik, J.N. Mordesonand and M.K. Sen, FUNDAMENTALS OF ABSTRACT ALGEBRA (1997), McGraw Hill, New York.

PBMS1001 – ALGEBRA – I

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Illustrate the applications of finite groups and demonstrate Sylow's theorem.	K2
CO2	Identify the class equation for finite groups.	K1
CO3	Facilitate the knowledge of direct products and modules.	K6
CO4	Analyze the various canonical forms of linear transformation.	K4
CO5	Apply the concepts of Hermitian, unitary and normal transformation.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓		✓	
CO3		✓	✓				✓	✓
CO4	✓			✓			✓	✓
CO5	✓	✓			✓		✓	✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. A. MOHAMED ALI		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS1002	DSC2	REAL ANALYSIS – I	6	5

Course Objectives

To work comfortably with functions of bounded variation, Riemann–Stieltjes integration, convergence of infinite series, infinite product and uniform convergence and its interplay between various limiting operations.

UNIT–I	FUNCTIONS OF BOUNDED VARIATION & INFINITE SERIES	18 hours
Introduction – Properties of monotonic functions – Functions of bounded variation – Total Variation – Additive property of total variation – Total variation on (a, x) as a function of x – Functions of bounded variation expressed as the difference of two increasing functions – Continuous functions of bounded variation. Absolute and conditional convergence –Dirichlet’s test and Abel’s test – Rearrangement of series – Riemann’s theorem on conditionally – Convergent series. Chapter 6: Sections 6.1 to 6.8 Chapter 8: Sections 8.8, 8.15, 8.17, 8.18		
UNIT–II	THE RIEMANN– STIELTJES INTEGRAL	18 hours
Introduction – Notation – The definition of the Riemann –Stieltjes integral – Linear properties – Integration by parts – Change of variable in a Riemann –Stieltjes integral – Reduction to a Riemann Integral – Euler’s summation formula – Monotonically increasing integrators, Upper and lower integrals – Additive and linearity properties of upper and lower integrals– Riemann’s condition – Comparison theorems. Chapter 7: Sections 7.1 to 7.14		
UNIT–III	THE RIEMANN–STIELTJES INTEGRAL (Contd...)	18 hours
Integrators of bounded variation – Sufficient conditions for the existence of Riemann–Stieltjes Integrals– Necessary conditions for the existence of Riemann–Stieltjes integrals – Mean value theorems for Riemann –Stieltjes integrals –The integrals as a function of the interval – Second fundamental theorem of integral calculus – Change of variable in a		

PBMS1002 - REAL ANALYSIS – I

Riemann integral – Second Mean Value Theorem for Riemann integral – Riemann-Stieltjes integrals depending on a parameter – Differentiation under the integral sign –Lebesgue criterion for the existence of Riemann integrals Chapter 7: Sections 7.15 to 7.26		
UNIT-IV	INFINITE SERIES AND INFINITE PRODUCTS	18 hours
Double sequences – Double series – Rearrangement theorem for double series – A sufficient condition for equality of iterated series – Multiplication of series –Cesaro summability– Infinite products. POWER SERIES Multiplication of power series – The Taylor’s series generated by a function– Bernstein’s theorem – Abel’s limit theorem –Tauber’s theorem Chapter 8: Sections 8.20, 8.21 to 8.26 Chapter 9: Sections 9.14, 9.15, 9.19 9.20, 9.22, 9.23		
UNIT-V	SEQUENCE OF FUNCTIONS	18 hours
Point wise convergence of sequence of functions –Examples of sequences of real – Valued functions – Definition of uniform convergence –Uniform convergence and continuity –The Cauchy condition for uniform convergence– Uniform Convergence of infinite series of functions – Uniform convergence and Reimann–Stieltjes integration– Non-uniform convergence and term by term integration –Uniform convergence and Differentiation – Sufficient condition for uniform convergence of a series – Mean convergence. Chapter 9: Sections 9.1 to 9.6, 9.8, 9.9, 9.10, 9.11, 9.13		
Books for Study: Tom M. Apostol, MATHEMATICAL ANALYSIS (Second Edition) (2002), Addison–Wesley Publishing Company Inc. New York.		
Books for Reference: 1. R. G. Bartle, REAL ANALYSIS, (1976), John Wiley and sons Inc. 2. W. Rudin, PRINCIPLES OF MATHEMATICAL ANALYSIS, (3rd Edition)(1976), McGraw Hill Company, New York. 3. S. C. Malik and Savita Arora, MATHEMATICAL ANALYSIS, (1991), Wiley Eastern Limited. New Delhi. 4. Sanjay Arora and Bansi Lal, INTRODUCTION TO REAL ANALYSIS(1991), Satya Prakashan, New Delhi. 5. A.L. Gupta and N. R. Gupta, PRINCIPLES OF REAL ANALYSIS(2003), Pearson Education.		

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Validate the functions of bounded variation and Rectifiable Curves.	K6
CO2	Describe the concept of Riemann–Stieltjes integral.	K1
CO3	Prove the properties of Riemann–Stieltjes integral.	K5
CO4	Discuss the double series, summability and power series.	K2
CO5	Test the convergence of sequence of functions.	K4
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓			✓	✓
CO2	✓		✓	✓			✓	✓
CO3		✓	✓	✓	✓		✓	✓
CO4	✓			✓	✓		✓	✓
CO5	✓	✓		✓			✓	✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. U. RIZWAN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS1003	DSC3	ORDINARY DIFFERENTIAL EQUATIONS	6	4

Course Objectives

The main purpose of the course is to solve the various methods of ordinary differential equations and understand the existence and uniqueness theorem

UNIT-I	LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS	18 hours
Second order homogeneous equations – Initial value problems – Linear dependence and independence –Wronskian and a formula for Wronskian– Non-homogeneous equation of order two. Chapter 2: Sections 1 to 6.		
UNIT-II	LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS (Contd...)	18 hours
Homogeneous and non-homogeneous equation of order n – Initial value problems – Annihilator method to solve non-homogeneous equation – Algebra of constant coefficient operators. Chapter 2: Sections 7 to 12.		
UNIT-III	LINEAR EQUATION WITH VARIABLE COEFFICIENTS	18 hours
Initial value Problems– Existence and uniqueness theorems – Solutions to solve a non-homogeneous equation –Wronskian and linear dependence – Reduction of the order of a homogeneous equation – Homogeneous equation with analytic coefficients – The Legendre equation. Chapter 3: Sections 1 to 8		
UNIT-IV	LINEAR EQUATION WITH REGULAR SINGULAR POINTS	18 hours
Euler equation– Second order equations with regular singular points – Exceptional cases – Bessel Function. Chapter 4: Sections 1 to 4 and 6 to 8		

PBMS1003 - ORDINARY DIFFERENTIAL EQUATIONS

UNIT-V	EXISTENCE AND UNIQUENESS OF SOLUTIONS TO FIRST ORDER EQUATIONS	18 hours
Equation with variable separated – Exact equation –Method of successive approximations – The Lipschitz condition – Convergence of the successive approximations and the existence theorem.		
Chapter – 5: Sections 1 to 6		
Books for Study: E.A. Coddington, AN INTRODUCTION TO ORDINARY DIFFERENTIAL EQUATIONS (2007), Prentice – Hall of India Ltd., New Delhi.		
Books for Reference: 1. W.T. Reid, ORDINARY DIFFERENTIAL EQUATIONS (1971), John Wiley and Sons, New York. 2. M.D. Raisinghania, ADVANCED DIFFERENTIAL EQUATIONS(2001), S.Chand & Company Ltd. New Delhi. 3. B. Rai, D.P. Choudary and H.I. Freedman, A COURSE IN ORDINARY DIFFERENTIAL EQUATIONS(2002), Narosa Publishing House, New Delhi.		

PBMS1003 - ORDINARY DIFFERENTIAL EQUATIONS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Recall IVP, linear dependence and independence and Wronskian formula.	K1
CO2	Solve the homogeneous and non-homogeneous equation of order n .	K3
CO3	Analyse the Legendre equation and their properties.	K4
CO4	Understand the Bessel function.	K2
CO5	Find the solution of exact equation and compute the successive approximations.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓		✓	✓	✓	✓
CO2		✓	✓		✓	✓	✓	✓
CO3		✓		✓		✓	✓	✓
CO4			✓		✓	✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓
Number of matches = 29, Correlation : High								
Prepared by				Verified by				
	Dr. R. SRINIVASAN							

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS1004	DSC4	CLASSICAL DYNAMICS	6	4

Course Objectives

To study mechanical systems under generalized co-ordinate systems. Virtual work, energy and momentum. To study mechanics developed by Newton, Lagrange, Hamilton Jacobi and theory of relativity due to Einstein.

UNIT-I	MECHANICAL SYSTEMS	18 hours
The mechanical systems – Generalized co-ordinates – Constraints – Virtual work – Energy and Momentum. Chapter 1: Sections 1.1 to 1.5		
UNIT-II	LAGRANGE'S EQUATIONS	18 hours
Derivation of Lagrange's equation – Examples – Integrals of motion. Chapter 2: Sections 2.1 to 2.3		
UNIT-III	HAMILTON EQUATIONS	18 hours
Hamilton's Principle – Hamilton's equation – Other Variational Principle. Chapter 4: Sections 4.1 to 4.3		
UNIT-IV	HAMILTON – JACOBI THEORY	18 hours
Hamilton's Principle Function – Hamilton–Jacobi Equation – Separability. Chapter 5: Sections 5.1 to 5.3		
UNIT-V	CANONICAL TRANSFORMATION	18 hours
Differential forms and Generating functions – Special Transformations – Lagrange and Poisson brackets. Chapter 6: Sections 6.1, 6.2 and 6.3		
Books for Study: D. T. Greenwood, CLASSICAL DYNAMICS (2016), Prentice Hall of India, New Delhi.		

PBMS1004 – CLASSICAL DYNAMICS

Books for Reference:

1. H. Goldstein, CLASSICAL MECHANICS(Second edition), Narosa PublishingHouse, New Delhi.
2. N.C. Rane and P.S.C. Joag, CLASSICAL MECHANICS(1991), Tata Mc Graw Hill.
3. J.L. Synge and B.A. Griffith, PRINCIPLES OF MECHANICS, McGraw HillBook Co, New York, (1970).

PBMS1004 – CLASSICAL DYNAMICS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concepts of mechanical systems.	K2
CO2	Establish the idea of Lagrange's equations.	K3
CO3	Analyze the Hamilton's principle.	K4
CO4	Identify the Jacobi equations and related problems.	K1
CO5	Prove the Lagrange and Poisson brackets.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓		✓	✓	✓	✓
CO2		✓	✓		✓		✓	✓
CO3		✓	✓	✓			✓	✓
CO4	✓	✓	✓		✓		✓	✓
CO5	✓	✓			✓		✓	✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. P. GOVINDARAJU		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE11	DSE1	OPERATIONS RESEARCH - I	6	4

Course Objectives

This course introduces advanced topics in linear and non – linear programming.

UNIT-I	INTEGER LINEAR PROGRAMMING	18 hours
Introduction – Types of Integer Programming Problems – Enumeration and Cutting Plane Solution Concepts – Gomory’s All Integer Cutting Plane Method – Gomory’s Mixed-Integer Cutting Plane Method – Branch and Bound Method. Chapter 7: Sections: 7.1 – 7.6		
UNIT-II	GOAL PROGRAMMING	18 hours
Difference between LP and GP. approach – Concept of Goal Programming – Goal Programming Model Formulation – Graphical Solution Method for Goal programming. Chapter 8: Sections: 8.1-8.5		
UNIT-III	CLASSICAL OPTIMIZATION METHODS	18 hours
Introduction – Unconstrained Optimization – Constrained Multivariable Optimization with Equality Constraints – Constrained Multivariable Optimization with Inequality Constraints. Chapter 23: Sections: 23.1 -23.4		
UNIT-IV	THEORY OF SIMPLEX METHOD	18 hours
Introduction – Canonical and Standard form of LP Problems – Slack and Surplus Variables – Reduction of Feasible solution to a Basic Feasible solution – Improving a Basic Feasible Solution – Alternative optimal solution – Unbounded solution – Optimality conditions. Chapter 25: Sections: 25.1 – 25.8		
UNIT-V	REVISED SIMPLEX METHOD	18 hours
Introduction – Standard forms for Revised simplex method –Computational procedure for Standard form I – Comparison of Simplex method and Revised simplex Method. Chapter 26: Sections: 26.1 – 26.4		

PBMSDE11 - OPERATIONS RESEARCH - I

Books for Study:

J.K. Sharma, OPERATIONS RESEARCH: THEORY AND APPLICATIONS, (2016) (Sixth Edition), Trinity Press, New Delhi.

Books for Reference:

1. Hamdy A. Taha, OPERATIONS RESEARCH (1997), Prentice Hall of India private Limited, New Delhi.
2. F.S. Hiller and J. Lieberman, INTRODUCTION TO OPERATIONS RESEARCH (2001), Tata – McGraw Hill, New Delhi.
3. Beightler C. D. Philips and B.Wilde, FOUNDATIONS OF OPTIMIZATION (Second edition) (1979), Prentice Hall, New York.
4. S.S. Rao, OPTIMIZATION THEORY AND APPLICATIONS(1990), Wiley Eastern, New Delhi.

PBMSDE11 - OPERATIONS RESEARCH - I

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the concepts of Integer Linear Programming Problems	K2
CO2	Examine and evaluate classical linear programming problems.	K1
CO3	Compile the primal linear programming problem into standard form and use the simplex method to solve it.	K6
CO4	Analyze the revised simplex method.	K4
CO5	Solve the Goal programming problem.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓		✓	✓
CO2		✓		✓		✓	✓	✓
CO3		✓		✓	✓		✓	✓
CO4	✓			✓		✓	✓	✓
CO5		✓		✓	✓	✓	✓	✓
Number of matches = 26, Correlation : High								
Prepared by				Verified by				
	Dr. V.J. SUDHAKAR							

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE12	DSE1	ADVANCED GRAPH THEORY	6	4

Course Objectives

To understand the concept of graphs, sub graphs, trees, connectivity, Euler tour, Hamilton cycle, matching, colouring of graphs, independent set, cliques, vertex colouring and planar graphs.

UNIT-I	GRAPHS AND SUB GRAPHS	18 hours
Graphs and simple graphs – Graph isomorphism – The Incidence and Adjacency matrices – Sub graphs – Vertex degrees – Paths and connection – Cycles – The shortest path problem. Chapter 1 : Sections: 1.1 to 1.8		
UNIT-II	TREES AND CONNECTIVITY	18 hours
Trees – Cut edges and Bonds – Cut vertices – Cayley's formula – The connector problem – Connectivity – Blocks. Chapter 2 : Sections: 2.1 to 2.5 Chapter 3 : Sections: 3.1 to 3.2		
UNIT-III	EULER TOURS AND HAMILTON CYCLES	18 hours
Euler tour – Hamilton cycles – The Chinese postman problem – The traveling salesman problem. Chapter 4 : Sections: 4.1 to 4.4		
UNIT-IV	MATCHING, INDEPENDENT SETS AND CLIQUES	18 hours
Matchings – Matchings and coverings in bipartite graphs – Perfect matchings – The personal assignment problem – The optimal assignment problem – Independent sets. Chapter 5 : Sections: 5.1 to 5.5 Chapter 7 : Section: 7.1		

PBMSDE12 – ADVANCED GRAPH THEORY

UNIT-V	VERTEX COLOURING AND PLANAR GRAPHS	18 hours
Chromatic number – Brook’s theorem – Chromatic polynomials – Plane and planar graphs – Dual graphs – Euler’s formula – The five colour theorem and the four colour conjecture. Chapter 8 : Sections: 8.1, 8.2, 8.4 Chapter 9 : Sections: 9.1 to 9.3, 9.6		
Books for Study: J.A. Bondy & U.S.R. Murty, GRAPH THEORY WITH APPLICATION (2011), Macmillan Press.		
Books for Reference: 1. K. R. Parthasarthy, <i>Basic graph theory</i>, Tata McGraw Hill Company, New Delhi, 1994. 2. P. Harary, <i>Graph theory</i>, Narosa Publishing House, New Delhi, 1998. 3. S. Arumugam & S. Ramachandran, <i>Invitation to graph theory</i>, SciTech publishing company, 200		

PBMSDE12 – ADVANCED GRAPH THEORY

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand basic concepts in Graph theory.	K2
CO2	Apply the understanding and use it to model real life situations.	K3
CO3	Analyze the concepts of connectivity, Euler and Hamilton cycles in the real life situations.	K4
CO4	Find the applications of planarity and colourability.	K5
CO5	Create graph models in network and computing.	K6
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓		✓	✓
CO2	✓	✓				✓	✓	✓
CO3			✓	✓		✓	✓	✓
CO4		✓	✓	✓	✓		✓	✓
CO5	✓	✓			✓	✓	✓	✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. ZAHIRUDDEEN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE13	DSE1	ALGEBRAIC NUMBER THEORY	6	4

Course Objectives

This course aims to provide a study on modules over rings, finite fields, algebraic extensions, number fields and cyclotomic fields, Noetherian rings modules and Dedekind rings.

UNIT-I	ALGEBRAIC BACKGROUND	18 hours
Rings and Fields – Factorization of Polynomials –Field Extensions – Symmetric Polynomials –Modules– Free Abelian Groups. Chapter 1: Sections 1.1 to 1.6.		
UNIT-II	ALGEBRAIC NUMBERS	18 hours
Conjugates and Discriminants – Algebraic Integers –Integral Bases – Norms and Trace – Rings of Integers. Chapter 2: Sections 2.1 to 2.6.		
UNIT-III	QUADRATIC AND CYCLOTOMIC FIELDS	18 hours
Quadratic fields and cyclotomic fields : Factorization into irreducibles : Trivial factorization FACTORIZATION INTO IRREDUCIBLES Factorization into irreducible – Examples of non unique factorization into irreducibles. Chapter 3: Sections 3.1 to 3.2. Chapter 4: Sections 4.2 to 4.4.		
UNIT-IV	FACTORIZATION INTO IRREDUCIBLES (Contd...)	18 hours
Prime Factorization – Euclidean Domains – Euclidean Quadratic fields –Consequences of unique factorization– The Ramanujan–Nagell Theorem. Chapter 4: Sections 4.5 to 4.9.		
UNIT-V	IDEALS	18 hours
Prime Factorization of ideals – The norms of an ideal – Non unique Factorization in Cyclotomic Fields. Chapter 5: Sections 5.2 to 5.4.		

PBMSDE13- ALGEBRAIC NUMBER THEORY

Books for Study:

Steward and D. Tall, ALGEBRAIC NUMBER THEORY AND FERMAT'S THEOREM (2002), (Third Edition), A.K Peters Ltd, Natick, Mass.

Books for Reference:

1. Z.I. Bolevic and I.R. Safarevic, NUMBER THEORY(1966), Academic Press, New York.
2. J.W.S Cassels and A. Frohlich, ALGEBRAIC NUMBER THEORY(1967), Academic Press, New York.
3. P. Ribenbiom, ALGEBRAIC NUMBER(1972), Wiley, New York.
4. P.Samuel, ALGEBRAIC THEORY OF NUMBERS(1970), Houghton Mifflin Company, Boston.
4. A. Well, BASIC NUMBER THEORY(1967), Springer, New York.

PBMSDE13- ALGEBRAIC NUMBER THEORY

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Analyse the distinction between various concepts of Rings, Fields, Polynomials and free abelian groups.	K4
CO2	Discuss various algebraic integers types.	K2
CO3	Examine the fields.	K1
CO4	Find the prime factorization and its consequences.	K5
CO5	Calculate the prime factorization of ideals.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓	✓	✓			✓	✓
CO2			✓	✓	✓	✓	✓	✓
CO3		✓	✓	✓	✓		✓	✓
CO4		✓			✓	✓	✓	
CO5		✓	✓	✓	✓		✓	✓
Number of matches = 27, Correlation : High								
Prepared by				Verified by				
	Dr. S. BALAKRISHNAN							

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS2001	DSC5	ALGEBRA II	5	5

Course Objectives

To study field extension, roots of Polynomial, Galois Theory, finite fields, division rings, solvability by radical and to develop computational skill in abstract algebra.

UNIT-I	EXTENSION FIELDS	15 hours
Extension fields – Transcendence of e . Chapter 5: Sections 5.1 and 5.2.		
UNIT-II	ROOTS OF POLYNOMIALS	15 hours
Roots of polynomials – More about roots. Chapter 5: Sections 5.3 and 5.5		
UNIT-III	ELEMENTS OF GALOIS THEORY	15 hours
Elements of Galois theory – solvability by radicals Chapter 5: Sections 5.6, 5.7(omit Theorem 5.7.1)		
UNIT-IV	FINITE FIELDS	15 hours
Finite fields –Wedderburn’s theorem on finite division rings. Chapter 7: Sections 7.1 and 7.2 [Only theorem 7.2.1.]		
UNIT-V	SELECTED TOPICS	15 hours
A theorem of Frobenius– Integral Quaternions and the Four-Square theorem. Chapter 7: Sections 7.3 and 7.4.		
Books for Study: I.N. Herstein, TOPICS IN ALGEBRA, (Second Edition), Wiley Eastern Limited, New Delhi (2011).		

PBMS2001 - ALGEBRA II

Books for Reference:

1. M. Artin, ALGEBRA(1991), Prentice Hall of India.
2. P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul, BASIC ABSTRACT ALGEBRA(1997)(First Edition) Cambridge University Press.
3. I.S. Luther and I.B.S.Passi, ALGEBRA(1996), Vol. I: Groups; Vol. II: Rings, Narosa Publishing House, New Delhi.
4. D.S.Malik, J.N.Mordeson and M.K. Sen, FUNDAMENTALS OF ABSTRACT ALGEBRA(1997), McGraw Hill, New York.
5. N. Jacobson, BASIC ALGEBRA(1980), Vol.I& II, W.H.Freeman; also published by Hindustan publishing company, New Delhi.

PBMS2001 - ALGEBRA II

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Identify the various extension fields.	K1
CO2	Apply the roots of polynomial in various situation.	K3
CO3	Explain the elements of Galoi's theory.	K2
CO4	Prove Wedderburn's theorem on finite division rings.	K5
CO5	Analyse extensively the solvability by radicals.	K4
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓		✓		✓	✓
CO2		✓			✓	✓	✓	✓
CO3		✓	✓	✓	✓		✓	✓
CO4		✓			✓	✓	✓	✓
CO5	✓			✓	✓	✓	✓	✓
Number of matches = 27, Correlation : High								

Prepared by		Verified by	
	Dr. A. MOHAMED ALI		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS2002	DSC6	REAL ANALYSIS - II	6	5

Course Objectives

To introduce measure on the real line, Lebesgue measurability and integrability, Fourier Series and Integrals, in depth study in multivariable calculus.

UNIT-I	FOURIER SERIES AND FOURIER INTEGRALS	18 hours
Introduction – Orthogonal system of functions – The theorem on best approximation –The Fourier series of function relative to an orthonormal system – Properties of Fourier Coefficients– The Riesz-Fischer Theorem – The convergence and representation problems for trigonometric series – The Reimann-Lebesgue Lemma —Reimann’s localization theorem– Sufficient conditions for convergence of a Fourier Series at a particular point – Cesaro summability of Fourier series – Consequences of Fejer’s theorem –The Weiestrass approximation theorem. Chapter 11: Sections 11.1 to 11.8, 11.11 to 11.15 (Tom M. Apostol)		
UNIT-II	MULTIVARIABLE DIFFERENTIAL CALCULUS	18 hours
Introduction – The Directional derivative – Directional derivative and continuity – The total derivative – The total derivative expressed in terms of partial derivatives – An Applications to Complex – Valued Functions -The matrix of linear function– The Jacobian matrix – The chain rule – Matrix form of chain rule – The mean-value theorem for differentiable functions – A sufficient condition for differentiability– A sufficient condition for equality of mixed partial derivatives – Taylor’s theorem for functions of R^n to R^1. Chapter 12: Sections 12.1 to 12.14 (Tom M. Apostol)		
UNIT-III	IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS	18 hours
Introduction- Functions with non-zero Jacobian determinants – The inverse function theorem –The Implicit function Theorem –Extrema of real valued functions of one variable and several variables –Extremum problems with side conditions. Chapter 13: Sections 13.1 to 13.7 (Tom M. Apostol)		

PBMS2002 - REAL ANALYSIS - II

UNIT-IV	THE LEBESGUE INTEGRAL	18 hours
Length of open sets and closed sets – Inner and outer measure : Measurable sets – Properties of measurable sets – Measurable functions – Definition and existence of the Lebesgue integral for bounded function. Chapter 11: Sections 11.1 to 11.5 (R.R. Goldberg)		
UNIT-V	THE LEBESGUE INTEGRAL(Cont.)	18 hours
Properties of the Lebesgue integral for bounded measurable functions – The Lebesgue integral for unbounded functions – Some fundamental theorems – The metric space $L^2[a, b]$. Chapter 11: Sections 11.6 to 11.09 (R.R.Goldberg)		
Books for Study: 1. Tom M. Apostol, MATHEMATICAL ANALYSIS (Second Edition) (2002), Addison – Wesley Publishing Company Inc. New York, (for units I, II & III). 2. Richard R. Goldberg, METHODS OF REAL ANALYSIS (2019), Oxford & IBH Publishing, New Delhi (for Unit IV & V).		
Books for Reference: 1. J. C. Burkill, THE LEBESGUE INTEGRAL (1951), Cambridge University Press. 2. M. E. Munroe, MEASURE AND INTEGRATION (1971), Addison–Wiley. 3. H. L. Roydon, REAL ANALYSIS (1988), Macmillan Pub. Company, New York. 4. W. Rudin, PRINCIPLES OF MATHEMATICAL ANALYSIS(1979),McGraw Hill Company, New York. 5. S. C. Malik and Savita Arora, MATHEMATICAL ANALYSIS(1991), Wiley Eastern Limited, New Delhi. 6. Sanjay Arora and Bansilal, Satya Prakashan, INTRODUCTION TO REAL ANALYSIS, (1991), New Delhi.		

PBMS2002 - REAL ANALYSIS - II

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand and describe the basic concepts of Fourier series and Fourier integrals with respect to orthogonal system.	K2
CO2	Analyse the multivariable analysis.	K4
CO3	Solve extremum problems.	K3
CO4	Define the step function, upper function, Lebesgue function and their integrals.	K1
CO5	Prove the properties of Lebesgue integrals and establish the Levi monotone convergence theorem.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓		✓		✓	✓
CO2	✓	✓	✓	✓	✓		✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓
CO4	✓		✓	✓		✓	✓	
CO5					✓	✓	✓	✓
Number of matches = 29, Correlation : High								

Prepared by		Verified by	
	Dr. U. RIZWAN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS2003	DSC7	PARTIAL DIFFERENTIAL EQUATIONS	6	4

Course Objectives

The aim of the course is to introduce the various types of partial differential equations and obtaining solution of these equations.

UNIT-I	PARTIAL DIFFERENTIAL EQUATIONS OF FIRST ORDER	18 hours
Formation and solution of PDE – Integral surfaces – Cauchy problem order equation – Orthogonal surfaces – First order non-linear – Characteristics – Compatible system – Charpit method. Chapter 0: Sections 0.4 to 0.11		
UNIT-II	FUNDAMENTAL CONCEPTS	18 hours
Introduction – Classification of Second Order PDE – Canonical Forms – Adjoint Operators – Riemann's method. Chapter 1: Sections 1.1 to 1.5		
UNIT-III	ELLIPTIC DIFFERENTIAL EQUATIONS	18 hours
Derivation of Laplace and Poisson equation – BVP – Separation of Variables – Dirichlet's Problem and Neumann problem for a rectangle – Solution of Laplace equation in Cylindrical and spherical coordinates – Examples. Chapter 2: Sections 2.1, 2.2, 2.5 to 2.7, 2.10 to 2.13		
UNIT-IV	PARABOLIC DIFFERENTIAL EQUATIONS	18 hours
Formation and solution of Diffusion equation – Dirac-Delta function– Separation of variables method – Solution of Diffusion Equation in Cylindrical and spherical coordinates – Examples. Chapter 3: Sections 3.1 to 3.7 and 3.9		
UNIT-V	HYPERBOLIC DIFFERENTIAL EQUATIONS	18 hours
Formation and solution of one-dimensional wave equation – Canonical reduction – IVP – D'Alembert's solution – IVP and BVP for two-dimensional wave equation – Periodic solution of one-dimensional wave equation in cylindrical and spherical coordinate systems – Uniqueness of the solution for the wave equation – Duhamel's Principle – Examples. Chapter 4: Sections 4.1 to 4.4, 4.7 to 4.9, 4.11, 4.12		

PBMS2003 - PARTIAL DIFFERENTIAL EQUATIONS

Books for Study:

K. Sankara Rao, INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS(2007), Second Edition, Prentice Hall of India, New Delhi.

Books for Reference:

1. R.C. Mc Owen, PARTIAL DIFFERENTIAL EQUATIONS, (Second Edition)(2005), Pearson Education, New Delhi.
2. I.N. Snedden, ELEMENTS OF PARTIAL DIFFERENTIAL EQUATIONS(1983), McGraw Hill, New Delhi.
3. M.D. Raisinghania, ADVANCED DIFFERENTIAL EQUATIONS(2001), S. Chand & Company LTD, New Delhi.

PBMS2003 - PARTIAL DIFFERENTIAL EQUATIONS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Perform the classification of PDEs and compatible system.	K6
CO2	Convert the PDEs into canonical forms.	K2
CO3	Solve PDEs that we encounter frequently in various walks of life.	K3
CO4	Examine the elliptic, parabolic and hyperbolic differential equations.	K1
CO5	Find the solutions of Laplace equation in cylindrical and spherical coordinates.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1		✓			✓	✓	✓	✓
CO2		✓			✓		✓	✓
CO3	✓	✓	✓	✓			✓	✓
CO4		✓		✓	✓	✓	✓	
CO5	✓	✓	✓	✓		✓	✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. S. SOUNDARARAJAN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMS2004	DSC8	ADVANCED INTEGRAL EQUATIONS	5	4

Course Objectives

The aim of the course is to introduce the various types of integral equations and obtaining solution of these equations.

UNIT-I	LINEAR AND NON-LINEAR INTEGRAL EQUATIONS	15 hours
Abel's Problem – Integral equation. Definition – Linear and non-linear integral equations – Fredholm integral equation – Volterra integral equation – Singular integral equation – Special kinds of kernels – Integral equation of the convolution type – Iterated kernels or functions – Resolvent kernel or reciprocal kernel – Eigen values (or characteristic values or characteristic numbers). Eigen functions (or fundamental functions) – Solution of an integral equation. Definition. Chapter 1 : Sections 1.2 – 1.12, 1.17, 1.18		
UNIT-II	CONVERSION OF ORDINARY DIFFERENTIAL EQUATIONS INTO INTEGRAL EQUATIONS	15 hours
Initial value problem – Method of converting an initial value problem into a Volterra integral equation – Alternative method of converting an initial value problem into a Volterra integral equation – Boundary value problem – Method of converting a boundary value problem into a Fredholm integral equation. Chapter 2 : Sections 2.2 – 2.6		
UNIT-III	METHOD OF SUCCESSIVE APPROXIMATIONS	15 hours
Iterated kernels or functions – Resolvent (or reciprocal) kernel – Theorem. To prove that $K_m(x,t) = \int_a^b K_r(x,y) K_{m-r}(y,t) dy$ – Solution of Fredholm integral equation of the second kind by successive substitutions – Solution of Volterra integral equation of the second kind by successive substitutions – Solution of Fredholm integral equation of the second kind by successive approximations. Iterative method (iterative scheme). Neumann series – Some		

PBMS2004 - ADVANCED INTEGRAL EQUATIONS

important theorems – Solved examples based on solution of Fredholm integral equation of the second kind by successive approximations (or iterative method) – Reciprocal functions – Volterra solution of Fredholm integral equation of the second kind – Solution of Volterra integral equation of the second kind by successive approximations (or iterative method).

Neumann series – Theorem. To prove that $R(x,t;\lambda) = K(x,t) + \lambda \int_t^x K(x,z) R(z,t;\lambda) dz$

Chapter 5 : Sections 5.2 – 5.12

UNIT-IV	INTEGRAL TRANSFORM METHODS	15 hours

Introduction – Some useful results about Laplace transform – Some special types of integral equations – Application of Laplace transform to determine the solution of Volterra integral equation with convolution-type kernels – Solved examples

Chapter 9 : Sections 9.1 – 9.5

UNIT-V	GREEN'S FUNCTION	15 hours

Adjoint equation of second order linear differential equation – Self adjoint equation – Solved examples – Green's formula – The Dirac delta function – Shifting property of Dirac delta function – Derivatives of Dirac delta function – Green's function – Conversion of a boundary value problem into Fredholm integral equation. Solution of a boundary value problem – An important special case – Solved example based on construction of Green's function – Solved examples.

Chapter 11 : Sections 11.2 – 11.8

Books for Study:

Raisinghania M. D. Integral Equation & Boundary Value Problem. S. Chand Publishing, 2007.

Books for Reference:

1. Kanwal, R.P. Linear Integral Equation. Theory and Techniques. Academic Press, 2014.
2. Jerri, A. Introduction to Integral Equations with Applications, John Wiley & Sons, 1999.
3. Hildebrand, F. B. Method of Applied Mathematics, Courier Corporation, 2012.
4. Wazwaz, A. M. A First Course in Integral Equations. World Scientific Publishing Co Inc, 1997.

PBMS2004 - ADVANCED INTEGRAL EQUATIONS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Define the concept of integral equations and types of integral equations.	K1
CO2	Develop integral equations from initial and boundary value problems.	K6
CO3	Evaluate the integral equations using the successive approximations and Neumann series.	K5
CO4	Apply Laplace transform techniques to integral equations.	K3
CO5	Express integral equations using Green's function.	K2
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓				✓	✓
CO2	✓	✓	✓		✓		✓	✓
CO3		✓			✓	✓	✓	✓
CO4	✓		✓		✓		✓	✓
CO5		✓		✓	✓	✓	✓	
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. S. BALAKRISHNAN		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE21	DSE2	OPERATIONS RESEARCH - II	6	4

Course Objectives

This course aims to introduce decision theory, PERT, CPM, deterministic and probabilistic inventory systems, queues, replacement and maintenance problems.

UNIT-I	DECISION THEORY	18 hours
Introduction – Steps of Decision-Making Process – Types of Decision Making Environments – Decision Making Under Uncertainty – Decision Making under Risk Chapter 11: Sections 11.1 to 11.5		
UNIT-II	PROJECT MANAGEMENT: PERT AND CPM	18 hours
Introduction – Basic Differences between PERT and CPM – Phases of Project Management – PERT / CPM Network Components and Precedence Relationships – Critical path Analysis – Project Scheduling with Uncertain Activity Times – Project time – Cost Trade off. Chapter 13: Sections 13.1 to 13.7		
UNIT-III	DETERMINISTIC INVENTORY CONTROL MODELS	18 hours
Introduction – Meaning of Inventory control – Functional Role of Inventory – Reasons for Carrying Inventory – Factors Involved in Inventory Problem Analysis – Inventory Model building – Single Item Inventory Control Models without Shortages – Single Item Inventory Control Models with Shortages. Chapter 14: Sections 14.1 to 14.8		
UNIT-IV	QUEUEING THEORY	18 hours
Introduction – The Structure of a Queuing System – Performance Measures of a Queuing System – Probability Distribution in Queuing Systems Classification of Queuing Models – Single-Server Queuing Models. Chapter 16: Sections 16.1 to 16.6.		
UNIT-V	REPLACEMENT AND MAINTENANCE MODELS	18 hours
Introduction – Types of Failure – Replacement of Items whose Efficiency Deteriorates with Time – Replacement of items that completely fail. Chapter 17: Sections 17.1 to 17.4		

Books for Study:

J.K. Sharma, OPERATIONS RESEARCH : THEORY AND APPLICATIONS, (2016) (Sixth Edition), Trinity Press, New Delhi.

Books for Reference:

1. F.S.Hillier and J.Lieberman, INTRODUCTION TO OPERATIONS RESEARCH, (Eighth edition)(2006), Tata McGraw Hill Publishing Company, NewDelhi.
2. C. Beightler, D.Phillips, and B. Wilde, FOUNDATIONS OF OPTIMIZATION, (Second edition)(1979), Prentice Hall New York.
3. M.S. Bazaraa, J.J.Jarvis, and H.D.Sharall, (1990), John Wiley and sons, New York.
4. D. Gross and C.M. Harris, FUNDAMENTALS OF QUEUEING THEORY [3rd Edition], (1998), Wiley and Sons, New York.
5. HamdyA.Taha, OPERATIONS RESEARCH, (Sixth edition), Prentice–Hallof India Private Limited, New Delhi.

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the characteristic of different types of decision-making environments.	K2
CO2	Justify the basic difference between PERT and CPM.	K5
CO3	Focus in inventory control models.	K4
CO4	Create queueing models based on verbal problem descriptions.	K6
CO5	Apply the knowledge in maintenance in real world problems.	K3
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓		✓				✓	✓
CO2	✓	✓	✓			✓	✓	✓
CO3	✓	✓	✓			✓	✓	
CO4		✓	✓		✓	✓	✓	
CO5			✓	✓	✓	✓	✓	✓
Number of matches = 26, Correlation : High								

Prepared by		Verified by	
	Dr. V.J. SUDHAKAR		

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE22	DSE2	TENSOR ANALYSIS	6	4

Course Objectives

The course aims to introduce vector algebra and vector calculus.

UNIT-I	TENSOR ALGEBRA	18 hours
Systems of Different orders – Summation Convention – Kronecker Symbols – Transformation of Coordinates in S_n – Invariants – Covariant and Contra variant vectors – Tensors of second order – Mixed Tensors – Zero Tensor– Tensor Field – Algebra of tensors. Chapter I: I.1 – I.8 Chapter II: II.1 – II.10		
UNIT-II	TENSOR ALGEBRA (Contd...)	18 hours
Equality of Two Tensors – Symmetric and Skew– symmetric Tensors – Outer Multiplication and Contraction – Inner Multiplication – Quotient Law of Tensors – Reciprocal Tensors of Tensor – Relative Tensor – Cross Product of Two Vectors – Examples – Exercise. Chapter II: Section II.11 – II.19		
UNIT-III	TENSOR CALCULUS	18 hours
Riemannian space – Christoffel Symbols and their Properties. Chapter III: Section III.1.1 to III.1.8 and III.2.1 to III.2.5		
UNIT-IV	TENSOR CALCULUS (Contd...)	18 hours
Covariant Differentiation of a Covariant and Contravariant Vector – Covariant Differentiation of Tensors of Type (0,2) – Covariant Derivative of a Tensor of Type (2,0) – Covariant Derivative of a Mixed Tensor of Type (1,1) – Covariant Derivative of a Mixed Tensor of Type (p, q) , Ricci's Theorem – Gradient of a Scalar – Divergence of Contravariant and Covariant Vector – Conservative Vector - Divergence of Contravariant Tensor of Order Two - Divergence of Mixed Tensor of Type (1,1) Chapter III: Section III.3.1 to III.3.13		

PBMSDE22 - TENSOR ANALYSIS

UNIT-V	TENSOR CALCULUS (Contd...)	18 hours
Laplacian of an Invariant – Curl of a Covariant Vector – Riemann-Christoffel Curvature Tensor – Intrinsic Differentiation.		
Chapter III: Section III.3.14 to III.3.15, III.4.1 to III.4.6, III.5		
Books for Study: U.C. De'Absos Ali Shaikh and Joydeep Sengupta, (2004), TENSOR CALCULUS, Narosa Publishing House, New Delhi.		
Books for Reference: 1. <i>J.L.Synge and A.Schild</i>, (1949), TENSOR CALCULUS, Toronto. 2. <i>David C Kay</i>, (2005), TENSOR CALCULUS, Schaum's Outlines, Tata McGraw Hill Publishing Company Ltd, New Delhi. 3. <i>C.E.Weatherburn</i>, (1988), RIEMANNIAN GEOMETRY AND THE TENSOR CALCULUS, Cambridge.		

PBMSDE22 - TENSOR ANALYSIS

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Describe and employ the concepts of Gradient, Divergence, Curl and their typical applications in Physics.	K1
CO2	Establish the Gamma function, Beta function, Dirac function, Delta function, Bessel function and their	K3
CO3	Illustrate Lagrangian and Hamiltonian approaches in classical mechanics.	K2
CO4	Adapt to tensors in physics.	K6
CO5	Evaluate special type of matrices that are relevant in Physics.	K5
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓		✓		✓	
CO2	✓	✓	✓			✓	✓	
CO3	✓	✓	✓			✓	✓	✓
CO4		✓	✓		✓	✓	✓	✓
CO5			✓	✓		✓	✓	✓
Number of matches = 27, Correlation : High								
Prepared by				Verified by				
	Dr. ZAHIRUDDEEN							

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS./ WEEK	CREDIT
PBMSDE23	DSE2	STOCHASTIC PROCESSES	6	4

Course Objectives

To introduce to the students the basic ideas of Stochastic processes, Markov chains, Markov process and Renewal process and to motivate research in these areas

UNIT-I	STATIONARY PROCESS	18 hours
Specification of Stochastic processes – Stationary processes – Markov chains – Definitions and Examples – Higher Transition Probabilities – Generalization of Independent Bernoulli trials – Sequence of chain dependent trials. Chapter 2 :Sections 2.2, 2.3 Chapter 3 :Sections 3.1 to 3.3		
UNIT-II	MARKOV CHAINS	18 hours
Stability of Markov system – Graph theoretic approach – Markov chain with denumerable Number of states – Reducible chains – Statistical inference for Markov chains. Chapter 3 :Sections 3.6 to 3.10		
UNIT-III	MARKOV PROCESSES WITH DISCRETE STATE SPACE: POISSON PROCESS AND ITS EXTENSIONS	18 hours
Poisson process – Poisson process and related distributions – Generalizations of Poisson process – Birth and death process – Markov process with discrete state space (Continuous time Markov chains). Chapter 4 :Sections 4.1 to 4.5		
UNIT-IV	MARKOV PROCESSES WITH CONTINUOUS STATE SPACE	18 hours
Brownian motion – Wiener process – Differential equations for Wiener Process – Kolmogorov equations – First passage time distribution for Wiener process. Chapter 5 :Sections 5.1 to 5.5		

PBMSDE23 - STOCHASTIC PROCESSES

UNIT-V	RENEWAL PROCESS AND THEORY	18 hours
Renewal process – Renewal process in continuous time – Renewal equation – Stopping time – Wald's equation – Renewal theorems – Delayed and equilibrium renewal process. Chapter 6 :Sections 6.1 to 6.6		
Books for Study: J. Medhi, Stochastic Processes Second Edition, New Age International Publication, New Delhi, 2002.		
Books for Reference: 1. Erhan. Cinlar, INTRODUCTION TO STOCHASTIC PROCESSES, Prentice Hall Inc., 1975. 2. Samauel Karlin, A FIRST COURSE IN STOCHASTIC PROCESSES, 2nd Edition, Academic Press, 1968. 3. S.K. Srinivasan and A. Vijayakumar, STOCHASTIC PROCESSES, Narosa Publishing House, New Delhi, 2003. 4. V. Narayan Bhat and Gregory K Miller, ELEMENTS OF APPLIED STOCHASTIC PROCESSES, John Wiley and Sons, Third Edition, 2002.		

PBMSDE23 - STOCHASTIC PROCESSES

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Define the basic concepts of Stochastic process.	K1
CO2	Determine the different states related to Markov chains.	K3
CO3	Evaluate and determine moments of Poisson process, Birth and Death process and Markov process.	K5
CO4	Focus the concept of Wiener process.	K4
CO5	Demonstrate the applications to Renewal process to real life problems.	K2
K1 – Remembering / Knowledge, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓			✓	
CO2			✓		✓	✓	✓	✓
CO3		✓			✓	✓	✓	✓
CO4				✓	✓	✓	✓	✓
CO5			✓	✓	✓	✓	✓	✓
Number of matches = 26, Correlation : High								
Prepared by				Verified by				
	Dr. S. BALAKRISHNAN							

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

DEPARTMENT OF PHYSICS
UG & PG SYLLABI

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc. PHYSICS

On the completion of this program the student will be able to

PSO 1 Explains fundamental principles and concepts in various branches of physics.

PSO 2 Use the concepts of physics to analyze and solve the physical problems.

PSO 3 Coordinate the physics knowledge through observation.

PSO 4 Realize, develop an understanding of the impact of physics concepts and carry out independently in real life situation.

PSO 5 Students will develop the proficiency in the acquisition of data using a variety of laboratory instruments and analyse, interpret of using relevant software and computers.

PSO 6 By performing experiments in the laboratories and interpret findings to draw logical conclusions.

PSO 7 Discover new ideas in physics, synthesize critically and communicate in scientific forums.

PSO 8 Able to appear for competitive examinations with confidence and pursue continuous learning through MOOC, ODL and various learning platforms.

Mapping of PSOs with POs

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓	✓	✓	-	-	✓	-	-	-
PSO2	-	✓	✓	✓	-	-	✓	-	✓	-
PSO3	-	✓	✓	✓	-	✓	✓	-	-	-
PSO4	✓	-	✓	✓	✓	✓	✓	-	✓	-
PSO5	✓	✓	✓	✓	-	✓	✓	✓	✓	-
PSO6	✓	✓	-	✓	-	✓	✓	-	✓	-
PSO7	✓	-	-	✓	✓	✓	✓	✓	✓	-
PSO8	-	-	✓	✓	-	-	✓	-	✓	-

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPY1001	DSC1	PROPERTIES OF MATTER AND ACOUSTICS	3	3
Instructional Objectives				
1. It is aimed at to explain the concepts of physical properties of materials like elasticity. 2. To provide the knowledge of viscosity of fluids and its applications. 3. To make them understand the basic concepts of surface tension. 4. To explain the nature of waves and oscillations. 5. To acquire knowledge about acoustics and its applications.				
Unit-I	Elasticity			9 Hours
Hooke’s law – Modulus of Elasticity – Relation between elastic constants – Poisson’s Ratio– Behavior of a wire under progressive tension-Determination of Poisson’s ratio for rubber- Significance of stress and strain diagram-Work done in stretching and work done in twisting a wire – Torsional pendulum (with & without masses) – Bending of beams - Expression for bending moment – Theory and experimental determination of rigidity modulus by static torsion method (scale and telescope).				
Unit-II	Viscosity			9 Hours
Newton’s law of viscous flow - streamline and turbulent motion- Reynold’s number and its significance- Poiseuille’s formula for the flow of liquid through a capillary tube –Experimental determination of coefficient of liquid by Poiseuille’s method- Terminal velocity and Stokes formula —Experimental determination by Stoke’s method-Friction and lubrication- Meyer’s formula for Viscosity of gas.				
Unit-III	Surface Tension			9 Hours
Definition- Molecular interpretation - Surface energy – Work done in blowing a bubble -Excess of pressure in liquid drops and air bubbles – Angle of contact – Experimental determination of surface tension – Jaegar’s method - Drop- weight method - Capillary rise method - Variation of surface tension with temperature-Excess pressure inside a curved surface and its special cases- Osmosis-Experimental determination of osmotic pressure by Berkeley and Hartley method.				
Unit-IV	Waves and Oscillations			9 Hours
Simple harmonic motion – Free, damped, forced vibrations and resonance – Velocity of Transverse wave in a stretched string– Superposition of waves –Intensity and loudness of sound-decibel-Laws of vibration of stretched string and its verification -Determinationof ACfrequency– Sound waves in gases –Beats – Doppler effect and its special cases.				
Unit-V	Sound and its Applications			9 Hours
Acoustics –Reverberation-Reverberation time and its measurements – Noise and music-Musical sound - Harmony and Melody-Diatonicscale-Tempered scale-Microphone-Crystal				

1. Properties of Matter by Murugesan R, S Chand & Co. Pvt. Ltd., New Delhi, 2012
2. Elements of Properties of Matter by Mathur D S, Shyamlal Charitable Trust, New Delhi, 2010
3. Text book of Sound by BrijLal & Subramaniam N. Vikas Publishing House, New Delhi, 2018
4. The Physics of Waves and Oscillations, N.K. Bajaj, McGraw Hill Education, Noida, 2019

1. Fundamentals of General Properties of Matter by Gulati H R, R Chand & Co. New Delhi, 2012
2. Waves & Oscillations by Subrahmanyam N & Brij Lal, Vikas Publishing House Pvt. Ltd., New Delhi, 2018
3. A Textbook of Sound by Khanna D R & Bedi R S, Atma Ram & Sons, New Delhi 2014
4. Fundamentals of Physics, 6th Edition by D Halliday, R Resnick and J Walker, Wiley 2018.

Chalk and Talk, ICT Presentation, Video Lectures, Assignments and Problem Solving involving students.

On the completion of this course the students will be able to

K1-Remembering/Knowledge, K2-Understand,K3-Apply

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓	–	✓
CO2	✓	✓	✓	✓	✓	✓	–	✓
CO3	–	✓	✓	✓	✓	✓	–	✓
CO4	–	–	✓	✓	✓	✓	✓	–
CO5	✓	✓	✓	✓	–	–	–	✓

Number of matches = 30, Correlations: Very High

Number of matches = 30, Correlations: Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPY2001	DSC2	THERMAL PHYSICS	6	6
Instructional Objectives				
1. To provide knowledge of thermometry and calorimetry. 2. To introduce the basic concepts of thermodynamics. 3. To make students understand the science of low temperature physics. 4. To explain the flow of heat through conduction and radiation. 5. To make students aware of causes and effects of global warming.				
Unit-I	Thermometry and Calorimetry			12Hours
Different thermometric scales and relation between them -Platinum resistance thermometer – Cullender& Griffith's bridge - Thermistor - Specific heat capacity of liquid - method of mixtures - Barton's correction – Newton’s law of cooling and verification - Specific heat capacity of gases – Meyer’s relation - C _p and C _v by Regnault's method, Callender and Barne's method- Seeback effect, Peltier and Thomson effect-Calorific values of fuels.				
Unit-II	Thermodynamics			12 Hours
Thermodynamic scale of temperature-Zeroth law of thermodynamics-First law of thermodynamics - second law of thermodynamics -Heat engine –Petrol engine–Carnot’s cycle as refrigerator- - entropy- change of entropy in reversible and irreversible processes - third law of thermodynamics - Maxwell’s thermo dynamical relations - derivation - Clausius - Clapeyron equation - First order Phase Transition-Equilibrium between liquids and its vapour.				
Unit-III	Low temperature Physics			12 Hours
Joule Kelvin effect – Joule-Thomson effect – Helium I and II- Helium a unique liquid - porous plug experiment along with theory-Low temperature physics and its applications–Production of low temperature by adiabatic demagnetization –Superconductors – Type I and Type II – Meissner effect – Refrigeration cycle-Electrolux Refrigerator.				
Unit-IV	Transmission of Heat			12 Hours
Definition and dimension of thermal conductivity – Definition of Thermal diffusivity - Thermal conductivity of a good conductor- Forbe’s method- Thermal conductivity of a bad conductor - Lee's disc method- Black body radiation –Stefan -Boltzmann law, Wien’s law, Planck's law and Stefan's law - Determination of Stefan’s constant - Angstrom pyro heliometer.				
Unit-V	Global Warming			12 Hours
Introduction-Consequences of Global Warming-The Greenhouse effect-Types of				

Greenhouse Gases-Evidence of Global Warming-Possible causes of Global Warming-Effects of Global Warming-Efforts to control Global Warming.

Books for Study

1. Thermal Physics by A. B. Gupta and H. P. Roy, Books & Allied Ltd, 2010.
2. Heat, Thermodynamics and Statistical Physics by Brij Lal, Subramaniam and P.S. Hemne S Chand & Co, New Delhi, 2016
3. Elementary Statistics by Gupta and Kumar, Pragati Prakashan, Meerut, 2017.

Books for Reference:

1. Thermodynamics by C. P. Arora, McGraw Hill Education, New Delhi, 2017
2. Thermodynamics and statistical Physics by Sharma & Sarkar, Himalaya Publishing House, Mumbai, 2018
3. Statistical Mechanics by Sathya Prakash & C. Agarwal, KNRN Publisher, Meerut, 2021.
4. Fundamentals of Physics, 6th Edition, by D. Halliday, R. Resnick and J. Walker, Wiley, New Delhi, 2018.

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video Lectures, Assignments and Problem Solving involving students.

COURSE OUTCOME

On the completion of this course the students will be able to

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Apply the principles of thermometry and calorimetry along with the determination of Specific heat capacity.	K1, K2, K3
CO2	Understand the laws of thermodynamics and Maxwell's thermodynamic relations	K1, K2
CO3	learn the basic concepts of low temperature physics and their significant role in applied physics and instrumentation	K1, K2, K3
CO4	Apply principles of thermal conduction and radiation in materials.	K1, K2, K3
CO5	Understand the idea of Global Warming and its effects.	K1, K2
K1-Remembering/Knowledge, K2-Understand, K3-Apply		

Mapping of COs with PSOs

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	–	✓	–	✓
CO2	✓	–	✓	✓	–	–	–	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	–	✓	✓	–
CO5	✓	✓	✓	✓	–	✓	✓	–
Number of matches = 30, Correlations: Very High								

SEMESTER I& II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPYPR21	DSC3	PHYSICS PRACTICAL- I	3	3
Instructional Objectives				
1. To develop the skills among students while performing experiments. 2. To demonstrate the use of the apparatus correlating the physics concepts. 3. To train students handling simple measuring instruments and also measure certain optical, mechanical and thermal properties of matter. 4. To develop the team work among students through experiential learning.				
List of Experiments				
Any Twelve Experiments				
Unit-I	CYCLE I			9Hours
1. Young’s modulus – non uniform bending – optic lever – Scale and Telescope. 2. Surface tension and interfacial surface tension – by drop weight method. 3. Sonometer – frequency of a tuning fork.				
Unit-II	CYCLE II			9 Hours
4. Rigidity modulus – Torsional pendulum – without masses 5. Focal length of a convex lens. 6. Specific heat capacity of a liquid – Method of mixtures.				
Unit-III	CYCLE III			9 Hours
7. Sonometer – Determination of AC frequency Using steel wire (Electromagnet) 8. Spectrometer- Refractive index of a glass prism (minimum deviation)				

9. Potentiometer – Calibration of low range voltmeter.		
Unit-IV	CYCLE IV	9 Hours
10. Young's modulus – non uniform bending – pin and microscope. 11. Coefficient of viscosity of a liquid – graduated burette - Radius of capillary tube by mercury pellet method. 12. Specific heat capacity of a liquid – Newton's law of cooling method.		
Unit-V	CYCLE V	9 Hours
13. Rigidity modulus and moment of inertia – Torsional pendulum – with identical masses 14. Determination of Stefan's constant. 15. Determination of Planck's constant.		
Books for Study: 1. Practical Physics by C. C. Ouseph, U.J. Rao, V. Vijayendiran, Viswanathan.S Printers and Publishers Private Ltd., Chennai, 2015 2. A Textbook of practical Physics by M.N. Srinivasan, S. Balasubramanian, R. Ranganathan, Sultan Chand & Sons, New Delhi, 2017.		
Books for Reference: 1. B.Sc. Practical Physics by C.L.Arora,S.Chand& Co , New Delhi,2010. 2. Practical Physics by P. R. Sasi Kumar, PHI ,New Delhi,2014. 3. Advanced Practical Physics by S. P. Singh, PragathiPrakashan,Meerut,2017.		

Methodology of Teaching

Demonstration of experimental techniques and measurements of physical parameters.

COURSE OUTCOME

On the completion of this course the student will be able to

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Determine Young's modulus ,Rigidity modulus ,Viscosity and surface Tension of the given material	K1,K2,K3
CO2	Measure the frequency of tuning fork and AC main	K1, K2,K3
CO3	Find the specific heat capacity of the given liquid	K1,K2,K3
CO4	Determine the refractive index of a material and focal length of material of the lens and Calibrate the low range voltmeter	K1,K2,K3
CO5	Determine physical constants Stefan's and Planck's	K1,K2,K3
K1-Remembering/Knowledge, K2-Understand,K3-Apply		

Mapping of COs with PSOs

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓	–	✓
CO2	✓	✓	✓	✓	✓	✓	✓	–
CO3	✓	–	✓	✓	✓	✓	–	–
CO4	✓	✓	✓	✓	✓	✓	–	–
CO5	✓	✓	✓	✓	✓	✓	–	✓
Number of matches = 32, Correlations: Very High								

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCHAL11	OEC1	ALLIED PHYSICS-I	5	5
Instructional Objectives				
1. To explain the properties of materials like elasticity, surface tension and viscosity. 2. To provide the knowledge of thermal physics. 3. To make them understand the basic concepts of electricity and magnetism. 4. To illustrate the propagation of sound waves, production of ultrasonic waves and its applications. 5. To provide knowledge of optics and lasers.				
Unit-I	Properties of Matter			12Hours
Elasticity: Hooke’s law-Elastic constants Poisson’s ratio-bending of beam- Determination of Poisson’s ratio for rubber- – Bending moment –Expression for depression at the loaded end of a cantilever – determination of Young’s modulus by non-uniform bending.				
Torsion: Torsional pendulum – Time period – Rigidity Modulus – Determination of rigidity modulus by Torsional oscillation (without masses).				
Surface Tension: Surface Tension –interfacial tension – determination of surface tension and interfacial tension by the method of drops.				
Unit-II	Heat			12 Hours
Specific heat – Callender and Barne’s method to determine the specific heat capacity of a liquid – Newton’s law of cooling – determination of specific heat of a liquid using Newton’s law of cooling – Emissivity and Emissive power-Black body radiation-Wien’s displacement law, Rayleigh Jean’s law- Definition and determination of Thermal Conductivity of a good				

conductor by Forbe's method.		
Unit-III	Electricity and Magnetism	12 Hours
Electricity: Potentiometer – Principle – Calibration of low range voltmeter - Measurement of internal resistance of cell – measurement of an unknown resistance- Capacitance of a capacitor– Determination of Capacitance of spherical and parallel plate capacitor – energy of a charge capacitor. Magnetism :Biot- Savart law – Magnetic flux- Magnetic Induction at a point due to a straight conductor carrying current–Moment and pole strength of a magnet – Deflection magnetometer – Tan-C position – Vibration magnetometer – Theory – period of oscillation.		
Unit-IV	Sound and Acoustics of Building	12 Hours
Sound: Laws of vibrations in a stretched strings – Velocity and frequency of vibrations of a stretched string — Sonometer – A.C. Frequency - Steel wire – Brass wire. Ultrasonics – properties-Production by Piezo – electric method – Industrial and Medical Applications of Ultrasonics -Non-Destructive Testing. Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula [definition only] – Sound absorption co-efficient of surface – conditions for the perfect acoustics in auditorium and halls.		
Unit-V	Optics and Laser Studies	12 Hours
Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source using a grating by normal Incidence. Polarization: Optical activity –specific rotatory power –Determination of specific rotatory power of a solution using Laurent's half shade polarimeter. Laser: Principle and Characteristics of Laser-spontaneous and stimulated emission-Principle, construction and working of Ruby Laser-Principle of Holography-Recording of Hologram-Reconstruction of image.		
Books for Study: 1. Properties of Matter by Murugesan R, S Chand & Co. Pvt. Ltd., New Delhi, 2012 2. Heat, Thermodynamics and Statistical Physics by BrijLal, Subramaniam N and P.S.Hemne S Chand & Co, New Delhi, 2016 3. Electricity and Magnetism by R. Murugesan S. Chand & Co, New Delhi, 2019 4. The Physics of Waves and Oscillations, N.K.Bajaj, McGraw Hill Education, Noida, 2019 5. A text book of Optics by BrijLal, Subramaniam and M.N. Avadhanulu, 2012.		
Books for Reference: 1. Modern Physics by R. Murugesan and Kiruthiga Sivaprasath, S. Chand & Co, New Delhi, 2021. 2. Elements of Properties of Matter by Mathur D S, Shyamlal Charitable Trust, New Delhi, 2010 3. Fundamentals of General Properties of Matter by Gulati H R, R Chand & Co. New Delhi,		

Chalk and Talk, ICT Presentation, Video Lectures, Assignments and Problem Solving involving students.

On the completion of this course the students will be able to

Mapping of COs with PSOs

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	–	✓	–	✓
CO2	✓	✓	✓	✓	–	–	–	✓
CO3	✓	✓	✓	✓	✓	–	✓	–
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 33, Correlations: Very High								

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCHAL21	OEC2	ALLIED PHYSICS-II	5	5
Instructional Objectives				
1. To explain the fundamental concepts of atomic physics. 2. To provide the knowledge of nuclear physics. 3. To make them understand the basic concepts of electromagnetism. 4. To illustrate the propagation of light through optical fibres and their applications. 5. To provide the knowledge of electronics.				
Unit-I	Atomic Physics			12Hours
Cathode Rays -Discovery of cathode Rays- Properties – Determination of e/m by Thomson’s parabola method- Positive Rays – Discovery – Properties-Atom model - Vector Atom model-electron spin and spatial quantization - Pauli's exclusion principle – Statement and Proof- Magnetic Dipole Moment-Spin magnetic moment-Stern and Gerlach Experiment.				
Unit-II	Nuclear Physics			12 Hours
Linear accelerator–Cyclotron– Particle detectors – GM counter – Transmutation of elements– Types of nuclear reaction – Basic concepts of fission and fusion – Nuclear reactor – Harmful effects of nuclear radiation – Preventive and safety measures- Origin of cosmic rays – primary and secondary cosmic rays – cosmic ray shower.				
Unit-III	Effects of Electric Current and Transient Current			12 Hours
Faraday’s laws of electromagnetic induction - vector form – Lenz’s law – self and mutual inductance – Determination of coefficient of self-inductance – Rayleigh’s method – Induction coil-electrical conductivity of an electrolyte-Determination of specific conductivity of an electrolyte- Growth and Decay of current in LR circuit – Growth and Decay of charge in RC circuit.				
Unit-IV	Fiber Optics			12 Hours
Optical fiber-Principle and structure of optical fiber cable -Propagation of light through an optical fiber - classification of optical fiber -Fiber optic communication system- block diagram-Fiber Optic Sensors- Active and Passive Sensors- Applications-Communication, Medical and Military-Liquid Level detector-Principle-construction and working.				
Unit-V	Electronics			12 Hours
Junction Diode - LED - Zener diode -LCD- Solar Cell– OLED -Boolean algebra - Demorgan's theorem – verification-AND, OR and NOT Gates ,NAND and NOR gates as Universal building Blocks.- NAND and NOR gates using diode and transistor.				
Books for Study:				
1. Modern Physics by R. Murugesan and KiruthigaSivaprasath,S. Chand &Co,New Delhi,2021. 2. Electricity and Magnetism by R. Murugesan S. Chand &Co,New Delhi,2019 3. Introduction to Fiber optics by K. Thyagarajan and Ajay Ghatak, Cambridge, University Press ,2017. 4. Electronic Principles and applications – A. B. Bhattacharya, New Central Book Agency,				

Kolkata,2011.

Books for Reference:

1. Fundamentals of Physics, 6th Edition by D Halliday, R Resnick and J Walker, Wiley 2018.
2. Electricity and Magnetism by Brijlal and Subramaniam, S. Chand & Co, New Delhi,2016.
3. An Introduction to Lasers Theory and Applications by Dr. M. N. Avadhanulu and Dr.P.S.Hemne, S. Chand & Co, New Delhi,2012.
- 4.Electronics Fundamentals and Applications by D.Chattopadhyay and P.C.Rakshit,New Age International Pvt. Ltd.,Bengaluru,2020.

Methodology of Teaching

Chalk and Talk, ICT Presentation, Video Lectures, Assignments and Problem Solving involving students.

COURSE OUTCOME

On the completion of this course the students will be able to

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Understand the cathode rays and positive rays and concepts of vector atom model and its proof.	K1,K2
CO2	Understand the basic ideas of particle accelerator and nuclear reactor.	K1,K2
CO3	Explain the fundamental Laws of electromagnetism and learn about transient currents.	K1,K2
CO4	Understand the basic concepts in fiber optics and its applications in communication system	K1,K2,K3
CO5	Gain the knowledge on working principles of electronic components and logic gates.	K1,K2,K3
K1-Remembering/Knowledge, K2-Understand,K3-Apply		

Mapping of COs with PSOs

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	–	–	–	–	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	–	–	–	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 33, Correlations: Very High								

SEMESTER I & II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCHAP21	DSC3	ALIIED PHYSICS PRACTICAL	3	3
Instructional Objectives				
1. To develop the skills among students while performing experiments. 2. To demonstrate the use of the apparatus correlating the physics concepts. 3. To train students handling simple measuring instruments and also measure certain optical, mechanical and thermal properties of matter. 4. To develop the team work among students through experiential learning.				
List of Experiments				
Any Twelve Experiments				
Unit-I	CYCLE I			9 Hours
1. Young’s modulus – non uniform bending – optic lever – Scale and Telescope. 2. Surface tension and interfacial surface tension – by drop weight method. 3. Sonometer – frequency of a tuning fork.				
Unit-II	CYCLE II			9 Hours
4. Rigidity modulus – Torsional pendulum – without masses 5. Focal length of a convex lens. 6. Specific heat capacity of a liquid – Method of mixtures.				
Unit-III	CYCLE III			9 Hours
7. Sonometer – Determination of AC frequency Using steel wire (Electromagnet)				

8. Spectrometer- Refractive index of a glass prism (minimum deviation) 9. Potentiometer – Calibration of low range voltmeter.		
Unit-IV	CYCLE IV	9 Hours
10. Young's modulus – non uniform bending – pin and microscope. 11. Coefficient of viscosity of a liquid – graduated burette - Radius of capillary tube by mercury pellet method. 12. Specific heat capacity of a liquid – Newton's law of cooling method.		
Unit-V	CYCLE V	9 Hours
13. Rigidity modulus and moment of inertia – Torsional pendulum – with identical masses 14. Sonometer – Determination of AC frequency Using brass wire (Barmagnet) 15. Specific heat capacity of a liquid by Joules calorimeter		
Books for Study: 1. Practical Physics by C. C. Ouseph, U.J. Rao, V. Vijayendiran, Viswanathan.S Printers and Publishers Private Ltd., Chennai, 2015 2. A Textbook of practical Physics by M.N. Srinivasan, S. Balasubramanian, R. Ranganathan, Sultan Chand & Sons, New Delhi, 2017.		
Books for Reference: 1. B.Sc. Practical Physics by C.L.Arora,S.Chand& Co , New Delhi,2010. 2. Practical Physics by P. R. Sasi Kumar, PHI ,New Delhi,2014. 3. Advanced Practical Physics by S. P. Singh, PragathiPrakashan,Meerut,2017.		

Methodology of Teaching

Demonstration of experimental techniques and measurements of physical parameters.

COURSE OUTCOME

On the completion of this course the student will be able to

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Determine Young's modulus ,Rigidity modulus ,Viscosity and surface Tension of the given material	K1,K2,K3
CO2	Measure the frequency of tuning fork and AC main	K1, K2,K3
CO3	Find the specific heat capacity of the given liquid	K1,K2,K3
CO4	Determine the refractive index of a material and focal length of material of the lens	K1,K2,K3
CO5	Calibrate the low range voltmeter using potentiometer	K1,K2,K3
K1-Remembering/Knowledge, K2-Understand,K3-Apply		

Mapping of COs with PSOs

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓	✓	✓	✓	✓	–	–
CO2	✓	✓	✓	✓	✓	✓	–	–
CO3	✓	✓	✓	✓	✓	✓	–	–
CO4	✓	✓	✓	✓	✓	✓	–	–
CO5	✓	✓	✓	✓	✓	✓	–	–
Number of matches = 30, Correlations: Very High								

PROGRAM SPECIFIC OUTCOMES (PSOs):

By the end of the program, the students will be able to

PSO1 Understand principles of physics for the scientific phenomena in classical domain.

PSO2 Understand the mathematical techniques for describing in depth knowledge of physical concepts.

PSO3 Understand and apply statistical methods for describing the classical and quantum particles in various physical systems and processes.

PSO4 Understand and apply inter-disciplinary concepts and for understanding and describing the natural phenomena.

PSO5 Understand the principles of Quantum mechanics for knowing the physical systems in quantum arena.

PSO6 Provide exposure in various specializations of Physics (Solid State Physics/Nuclear Physics/Particle Physics).

PSO7 Provide exposure to modern experimental/theoretical methods for measurement, observation and fundamental understanding of physical phenomena/systems.

PSO8 Engage in research and life-long learning to adapt to changing environment

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓		✓		✓	✓		✓	✓
PSO2	✓	✓	✓	✓		✓	✓		✓	✓
PSO3	✓	✓	✓	✓			✓	✓	✓	✓
PSO4	✓	✓		✓	✓		✓	✓	✓	✓
PSO5	✓	✓		✓		✓		✓	✓	✓
PSO6	✓	✓	✓	✓	✓	✓		✓	✓	✓
PSO7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Mapping Correlation Benchmark

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High
Matching: 67	Correlation: Very High			

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY1001	DSC1	MATHEMATICAL PHYSICS	6	5

Course Objectives

OBJECTIVE: *The foundations to various mathematical techniques and tools like numerical methods, transform techniques and special functions which forms the backbone of all higher physics is introduced*

Unit-I	Linear Vector Spaces	12 Hours
Definition of Vector Space – Subspace – Linear Dependence – Linear Independence – Basis – Dimension of a Vector Space – Linear Operators – Representation of Vectors and Linear Operators in a basis – Inner Product – Orthonormal basis – Schwartz inequality – Gram-Schmidt Orthogonalization Process.		
Unit-II	Special Functions	12 Hours
Second order linear differential equations – Wronskian – Sturm-Liouville theorem – Orthogonality of eigen functions – Illustration with Legendre, Laguerre, Bessel and Hermite differential equations – Generating function – Recurrence relation – Rodrigue's formula – Expansion of polynomials.		
Unit-III	Complex Variables	12 Hours
Functions of a complex variable – Single and multivalued functions – Analytic functions – Cauchy-Riemann conditions – Singular points – Cauchy's theorem – Cauchy Integral formula – Taylor and Laurent expansions – Zeros and Poles – Cauchy Residue theorem and its applications.		
Unit-IV	Fourier and Laplace transforms	12 Hours
Laplace transforms – Solution of linear differential equations with constant coefficients – Fourier transforms – Fourier Sine and Cosine transforms – Convolution theorem – Parseval's Identity – Relationship between Fourier and Laplace transforms – Application to Heat Equation.		
Unit-V	Group Theory	12 Hours
Definition of Groups – Subgroups – Conjugate Classes – Cyclic Groups-Symmetry		

Elements-Transformation & Matrix Representation – Point & Space Groups – Representation of a Group – Reducible & Irreducible Representation – Schur's Lemmas – Orthogonality Theorem – Character of a Representation – Character Table for C_{2v} & C_{3v} – Point Groups in Molecular Physics – Application for Classification of Elementary Particles.

Books for Study:

1. **H. K. Dass**, Mathematical Physics, (2011 edition) and Rama Verma, S.Chandpublications.India.
2. **Sathya Prakash**, Mathematical Physics, 2014 edition, Sultan Chand & sons Publications. India.
3. **P. K. Chattopadhyay**, 1990, Mathematical Physics, Wiley Eastern, Madras.
4. **G. Arfken and H. J. Weber**, 2001, *Mathematical Methods for Physicists*, 5th Edition, Harcourt (India), New Delhi.
5. **E. Kreyszig**, 1999, *Advanced Engineering Mathematics*, 8th Edition, Wiley, New York.
6. **M. D. Greenberg**, 1998, *Advanced Engineering Mathematics*, 2nd Edition, International Ed., Prentice - Hall International, New Jersey.

Books for Reference:

1. **Tulsi Dass and S. K. Sharma**, 1998, Mathematical Methods in Classical and Quantum Physics, Universities Press (INDIA), Hyderabad.
2. **S. Lipschutz**, 1987, *Linear Algebra*, Schaum's Series, McGraw - Hill, New York
3. **E. Butkov**, 1968, *Mathematical Physics* Addison - Wesley, Reading, Massachusetts.
4. **P. R. Halmos**, 1965, *Finite Dimensional Vector Spaces*, 2nd Edition, Affiliated East-West, New Delhi.
5. **M. Hamermesh**, 1962, *Group Theory and Its application to Physical Problems*, Addison Wesley, Reading.
6. **C. R. Wylie and L.C. Barrett**, 1995, *Advanced Engineering Mathematics*, 6th Edition, International Edition, McGraw-Hill, New York.
7. **W. W. Bell**, 1968, *Special Functions for Scientists and Engineers*, Van Nostrand, London.
8. **M. A. Abramowitz and I. Stegun (Editors)**, 1972, *Handbook of Mathematical Functions* Dover, New York.

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY1002	DSC2	CLASSICAL MECHANICS	6	5

Course Objectives		
<i>Objectives: To introduce the classical formulation approaches like Lagrangian and Hamiltonian dynamics and to study their application in mechanical systems and solving of problems. Also, to review the fundamental concepts of relativity and to create an understanding of their applications</i>		
Unit-I	Lagrangian Formulation	12 Hours
Constraints - Generalized coordinates - Principle of virtual work- D'Alembert's principle- Lagrange's equations and simple applications-Variational principle and Lagrange's equations - Hamilton's principle - Deduction of Hamilton's principle - Lagrange's equations from Hamilton's principle - Symmetry and conservation laws- Principle of least action-Two-body central force problem -Kepler Problem and Kepler's laws		
Unit-II	Hamilton's Formulation	12 Hours
Hamiltonian equations- Cyclic coordinates - Liouville's theorem -Legendre transformation -Canonical transformations- Poisson brackets- Hamilton-Jacobi theory- Action and Angle variables.		
Unit-III	Mechanics of Rigid Bodies	12 Hours
Angular momentum and Rotational kinetic energy - Moment and product of inertia - Infinitesimal rotations- Principal Axes- Inertia tensor - Euler angles - Coriolis force- Euler's equations of motion - Poincaré method - Symmetrical top.		
Unit-IV	Small Oscillations	12 Hours
Theory of Small Oscillations - Normal mode analysis- Diatomic molecule -normal mode of a linear tri-atomic molecule- forced oscillations- Effect of dissipative forces on free		

and forced oscillations		
Unit-V	Special theory of Relativity	12 Hours
Relativistic Lagrangian of a particle- Relativistic Hamiltonian of a particle-spacetime diagram-invariance of Maxwell's equation-vector and scalar potential-gauge transformation-four vector potential-electromagnetic field tensor-general theory of relativity.		
Books for Study: 1. H. Goldstein, 2002, <i>Classical Mechanics</i>. 3rd Edition, C. Poole and J. Safko, Pearson Education, Asia, New Delhi. 2. B.D Gupta and SatyaPrakash, 1997, <i>Classical Mechanics</i> 5th Edition. Kedarnath Ramath, Meerut and New Delhi. 3. S. N. Biswas, 1998, <i>Classical Mechanics</i>, Books and Allied Ltd., Kolkata. 4. Upadhyaya, 1999, <i>Classical Mechanics</i>, Himalaya Publishing Co., New Delhi. 5. P. V, Panat, 2005 <i>Classical Mechanics</i> 5th Edition alpha Science International. 6. R. Douglas Gregory, 2006 <i>An Undergraduate Text of Classical Mechanics</i>, Cambridge University Press.		
Books for Reference: 1. D. Landau and E. M. Lifshitz, 1969, <i>Mechanics</i>, Pergomon Press, Oxford. 2. K. R. Symon, 1971, <i>Mechanics</i>, Addison Wesley, London. 3. J. L. Synge and B. A. Griffith, 1949, <i>Principles of Classical Mechanics</i>, McGraw-Hill, New York. 4. C. R. Mondal, <i>Classical Mechanics</i>, Prentice-Hall of India, New Delhi. 5. R. Resnick, 1968, <i>Introduction to Special Theory of Relativity</i>, Wiley Eastern, New Delhi. 6. R. P. Feynman, 1962, <i>Quantum Electrodynamics</i>, Benjamin, Reading, MA. 7. M. Glazer and J. Wark, 2001, <i>Statistical Mechanics</i>, Oxford University Press, Oxford.		
Course Learning Outcome (CLOs) By the end of the course, the students will be able to		
CLO	Course Learning Outcome	Knowledge level
CLO1	Understand the fundamental approach to apply Lagrange's equations and Hamiltonian in classical mechanics	K1, K2, K3
CLO2	Understand the fundamental approach to apply Hamiltonian formulation and get familiarized with Poisson brackets and Hamilton-Jacobi equation	K2, K3, K5
CLO3	Acquire the knowledge of Kinematics and Dynamics of rigid body in detail and ideas regarding Euler's equations of motion	K1, K2
CLO4	Study the different modes theory of small oscillations in detail along with basis of Free vibrations	K4, K5
CLO5	Gain basic ideas of relativity and its application	K1, K3

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY1003	DSC3	QUANTUM MECHANICS I	6	4

Course Objectives

This course is designed to expose the students to understand the inconsistencies in Classical Physics. Define Heisenberg & Dirac's formulation of quantum mechanics and explain their importance. Further to learn about the basic postulates of Quantum Mechanics. Solving Schrödinger's equation to find solutions for many systems such as particles in a box, Hydrogen atoms and familiarizing with different quantum numbers. Finally, to apply the formulation of Quantum Mechanics, through exactly solvable problems.

Unit-I	Basic formalism	12 Hours
Postulates of Quantum mechanics- Physical interpretation and condition of the wave function-Symmetric and Antisymmetric wave function- Time dependent and independent Schrodinger equation- Solution of the Schrodinger equation - Generalized uncertainty principle-Position momentum uncertainty -Ehrenfest's theorem and its proof.		
Unit-II	General formalism	12 Hours
Linear vector space-linear operator -operator associated with different observables- Expectation values of Dynamical quantities- Hermitian Operators and its Properties - Dirac's 'BRA' and 'KET' notation - Coordinate and momentum representations - Unitary transformation-Schrodinger picture-Heisenberg picture.		
Unit-III	Quantum Dynamics	12 Hours
Free particle-particle in a 3D box- square well potential-Rectangular potential - Barrier Penetration and tunneling- Solution of one-dimensional linear harmonic oscillator by ladder operator method - significance of zero-point energy.		
Unit-IV	Symmetries in Quantum Mechanics	12 Hours
Schrodinger's equation for spherically symmetry potentials -Three-dimensional harmonic oscillator (spherical symmetric case)-Rigid rotator with free axis-Hydrogen atom-recursion formula-Energy Eigen value- complete wave function- wave function for 1s state- degeneracy- normal state of the hydrogen atom.		

Unit-V	Angular Momentum	12 Hours
Angular momentum operators -position-rotation-Spin angular momentum- Total angular momentum operators-commutation relations of angular momentum operators-Eigen values of J^2 and J_z and J_x and J_y, Addition of angular momenta-Clebsch-Gordan coefficients.		
Books for Study: 1.Sathya Prakash and Swathi Saluja,2002, <i>Quantum Mechanics</i> , Kedar Nath ram Nath & Co, Meerut. 2.P. M. Mathews and K. Venkatesan, 1976, <i>A Text book of Quantum Mechanics</i> , Tata McGraw-Hill, New Delhi. 3.L. I. Schiff, 1968, <i>Quantum Mechanics</i> , 3 rd Edition, International Student Edition, MacGraw-Hill Kogakusha, Tokyo. 4. V. Devanathan, 2005, <i>Quantum Mechanics</i> , Narosa Publishing House, New Delhi.		
Books for Reference: 1.E. Merzbacher,1970, <i>Quantum Mechanics</i> 2 nd edition, John Wiley and Sons, New York. 2.P. A. M. Dirac,1973, <i>The Principles of Quantum Mechanics</i> , Oxford University Press, London. 3.L. D. Landau and E. M. Lifshitz, 1976, <i>Quantum Mechanics</i> Pergomon Press, Oxford. 4.S. N. Biswas, 1999, <i>Quantum Mechanics</i> , Books And Allied Ltd., Kolkata. 5.G. Aruldas, 2002, <i>Quantum Mechanics</i> , Prentice Hall of India, New Delhi. 6.A. Ghatak and S. Lokanathan, <i>Quantum Mechanics: Theory and Applications</i> , 4 th Edition, Macmillan India. 7.J. S. Bell, Gottfried and M.Veltman, 2001, <i>The Foundations of Quantum Mechanics</i> World Scientific, Singapore. 8.R. P. Feynman, R. B. Leighton, and M. Sands, 1998, <i>The Feynman Lectures on Physics</i> , Vols. 3, Narosa, New Delhi. 9.Gupta Kumar Sharma -2021, <i>Jai Prakash Nath Publications</i> , Meerut		
Course Learning Outcome (CLOs) By the end of the course, the students will be able to		
CLO	Course Learning Outcome	Knowledge level
CLO1	Interpret the conditions and Evaluate problems in Schrödinger's Equation	K1, K2, K3, K5
CLO2	Compare the Schrödinger's, Heisenberg and Interaction pictures	K2, K3
CLO3	Solve and analyze problems in particle in a box, Square well potential, Barrier penetration and Simple Harmonic Oscillator	K4. K5

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE11	DSEI	SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS	6	4

Course Objectives

To provide an exposure to the wide application of semiconductor devices, Optoelectronics devices, Operational amplifiers, 555 timer, Phase Locked Loop and voltage regulator.

Unit-I	SEMICONDUCTOR MATERIALS	12 Hours
Direct band and indirect band gap semiconductors, Charge carriers in extrinsic semiconductors, Effect of heavy doping, Diffusion currents, Mobility and its dependence on temperature and doping, Excess carriers in semiconductors – low level and high-level injection, Recombination of electro – hole pairs – various recombination mechanism. Types of junctions, abrupt and graded junctions, - potential distribution, space charge, built in voltage and junction capacitance, carrier concentration across the junction, Recombination		
Unit-II	OPTOELECTRONIC DEVICES	12 Hours
The ideal heterojunction, current – voltage characteristics, common anion rule. Light emitting diodes – Electroluminescent process. Excitation and emission, LED materials, Device configuration and efficiency, light output, LED structures, Manufacturing process;		
Unit-III	555 TIMER AND ITS APPLICATIONS	12 Hours
555 Timer – Description – Monostable operation – Frequency divider – Astable operation – Schmitt trigger – Phase-Locked Loops – Basic principles – Analog phase detector – Voltage controlled oscillator – Voltage to frequency conversion – PLL IC 565 – Description – Lock in range – Capture range – Application – Frequency multiplication.		
Unit-IV	OP-AMP APPLICATIONS	12 Hours
Basic op-amp-Instrumentation amplifier-V to I and I to V converter – Op-amp circuits using diodes-half wave and full wave rectifier-Sample and hold circuits – Log and		

Antilog amplifiers – Multiplier and Divider-Differentiator, Integrator-Electronic analog computation – **Triangle wave generator-sine wave generator.**

Unit-V	VOLTAGE REGULATORS AND A/D, D/A CONVERTERS	12 Hours
Series op-amp regulator - IC voltage regulators - Dual voltage supply - 723 General purpose regulator - Switch regulator - Weighted resistor DAC - R/2R Ladder DAC - A-D Converters - Direct and Counter type ADCs - Servo tracking and Successive approximation method - Dual Slope ADC.		
Books for Study:		
1. Pallab Bhattachary 2017, Second Edition, Semiconductors optoelectronic devices – Pearson 2. Thyagi 1991, Semiconductors material and devices – John Wiley 3. S.M.Sze, 1985, Semiconductor Devices – Physics and Technology, Wiley, New York. 4. V.K. Mehta and Rohit Mehta, 2012, Principles of Electronics, S. Chand & company, New Delhi. 5. D.RoyChoudhury and Shail Jain 1991, Linear Integrated circuits, New Age International(P) Limited, Publishers, New Delhi. 6. Milman and Halkias, Integrated Electronics, Mc-Graw – Hill, New Delhi. 7. R.A.Gaekwad, 1994, Op-Amps and integrated circuits EEE. 8. Taub and Shilling, 1983, Digital Integrated Electronics, McGraw Hill, New Delhi. 9. J.Millman, 1979, Digital and Analog Circuits and Systems, McGraw Hill, London. 10. George Kennedy, 1987, Electronic communication systems 3rd Edition, McGraw Hill, London.		
Books for Reference:		
1. R.F. Coughlin and F.F.Driscoll, 1996, Op-Amp and linear Integrated circuits, Prentice Hall of India, New Delhi. 2. M.S.Tyagi, Introduction to Semiconductor Devices, Wiley, New York. 3. P.Bhattacharya, 2002, Semiconductor Optoelectronic Devices, 2nd Edition, Prentice Hall of India, New Delhi.		
Course Learning Outcome (CLOs)		
By the end of the course, the students will be able to		
CLO	Course Learning Outcome	Knowledge level
CLO1	Understand the basic principle of semiconductor material	K2, K3, K4
CLO2	Learn basics of optoelectronic devices like LED. and their working and manufacturing in detail.	K4, K5, K6
CLO3	Understand the fundamental of 555 timer and its applications	K3, K4, K5
CLO4	Study the basic operational amplifier characteristics, OPAMP parameters, applications as inverter, integrator, differentiator etc.	K3, K4, K5
CLO5	Basic ideas of voltage regulator, A/D and D/A Converters	K2, K3, K4

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE12	DSEI	COMPUTATIONAL METHODS AND PROGRAMMING	6	4

Course Objectives

Objective: To inculcate a flair for scientific research with moral, ethical and social values and also to expose the students to the foundations of various Computational methods and C programming

Unit-I	SOLUTIONS OF EQUATIONS	12 Hours
Determination of zeros of polynomial - Roots of nonlinear algebraic equations and transcendental equations - Bisection and Newton-Raphson method - Convergence of solutions.		
Unit-II	LINEAR SYSTEMS	12 Hours
Solution of simultaneous linear equations - Gaussian elimination method - Matrix inversion - Eigenvalues and eigenvectors of matrices - Power and Jacobi Methods.		
Unit-III	INTERPOLATION AND CURVE FITTING	12 Hours
Interpolation with equally spaced and unevenly spaced points (Newton forward and backward interpolations, Lagrange interpolation) - Curve fitting - Polynomial leastsquares fitting - Cubic spline fitting.		
Unit-IV	DIFFERENTIATION, INTEGRATION AND SOLUTION OF DIFFERENTIAL EQUATIONS	12 Hours
Numerical differentiation - Numerical integration - Trapezoidal rule - Simpson's rule (1/3 & 3/8) - Error estimates - Gauss-Legendre, Gauss-Laguerre, Gauss-Hermite and Gauss-Chebyshev quadratures - Numerical solution of ordinary differential equations - Euler and Runge-Kutta methods for solving simultaneous equations.		
Unit-V	COMPUTATIONAL TECHNIQUES in MATLAB/SciLab	12 Hours

Introduction, basic usage, variables, scripts, operations -Functions, Flow control , Line Plots, mfiles, graphics, Image surface plots, Vectorization - Solving equations and curve fitting, Linear algebra, Polynomials, Optimization , Differentiation, Integration, Differential Equations - Advanced Methods, File I/O - visualization.

Books for Study:

1. Sastry, Introductory Methods of Numerical Analysis.
2. V. Rajaraman, Computer Oriented Numerical Methods, 3rd Ed. (Prentice-Hall, New Delhi, 1993).
3. M.K. Jain, S.r.Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, 3rd Ed. (New Age International, New Delhi, 1995).
4. F. Scheid, Numerical Analysis, 2nd Edition (Schaum's Series McGraw-Hill, NY, 1998).
5. W.H. Press, S.A. Teukolsky, W.T. Vetterling and B.P. Flannery, Numerical Recipes in FORTRAN, 2nd Edition (Cambridge University Press, 1992); First Indian Edition (Foundation Books, New Delhi, 1993).

Books for Reference:

- M.A. Abramowitz and I. Stegun (Editors), , 1996).
2. W.H. Press, S.A. Teukolsky, W.T. Vetterling and B.P. Flannery, Numerical Recipes in C, 2nd Edition, (Cambridge University Press, 1992); First Indian Edition (Foundation Books, New Delhi, 1993).
 3. Rajaraman, Fortran Programming.
 4. E. Kreyszig, Advanced Engineering Mathematics, 8th Ed. (Wiley, NY, 1999).
 5. www.mathworks.in, www.scilab.org

Course Learning Outcome (CLOs)

By the end of the course, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CLO1	Use Newton-Raphson methods to find a good approximation for the root of real value function.	K1. K3
CLO2	Solve Simultaneous linear equations by different method	K1. K2, K3
CLO3	Understand Interpolation, Curve fitting, Cubic line fitting	K2, K5
CLO4	Apply Trapezoidal rule - Simpson's rule, Euler and Runge-Kutta methods	K3, K4, K5
CLO5	Create Programme to solve the mathematical equation using computational methods	K5, K6

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE13	DSEI	PHYSICS OF THE EARTH	6	4

Course Objectives

- To understand the physical structure and behaviour of the earth as well as geomagnetic properties of rocks in the Earth's crust.
- To study the elastic behaviour in earth by applying various theories and hypothesis.
- To highlight the concept of solar system and behaviour of planets in this system.

Unit-I	SOLAR SYSTEM	12 Hours
The earth and the solar system – Important physical parameters and properties of the planet earth; Stress and Strain- Wave and motion-Seismic waves- Travel time Tables and Velocity – Depth curves – Variation of Density within the Earth.		
Unit-II	GRAVITATION	12 Hours
Rotation of the Earth - Gravitational attraction- Gravitational Theory- Measurements of Gravity- Gravity meters - Principles and method of measuring gravity - Gravity Anomalies-Local and regional variations		
Unit-III	THERMAL HISTORY OF EARTH	12 Hours
Thermal history of the Earth- Temperature in the Primitive Earth and the Earth's surface and interior. Thermal conductivity- Generation of heat in the Earth- Heat flow measurements, methods and results.		
Unit-IV	ELASTIC PROPERTIES	12 Hours
Elastic constants and Elastic process in the earth- Earth's free rotation. Latitude variation- Tides of the Solid earth- Numerical values of Love's numbers- Rigidity of the Earth-Bulk modules of earth. Poisson's ratio of Earth- Young's modulus and Lamé's constant		
Unit-V	GEOMAGNETISM AND PALAEOMAGNETISM	12 Hours
Geomagnetism and paleomagnetism-Earth's magnetic field- Origin-Theory of earth's magnetic field. Magneto hydrodynamics of the Earth. Magnetic reversals- Polar Wandering-Tectonic movements and its relation to paleomagnetism - Measurement of magnetic properties of rocks		

Books for Study:

1. A.H. Cook, Physics of the Earth and planets, Macmillan, 1973.
2. J. A. Jacobs, R. D. Russel and J. T. Wilson, Physics and Geology, 1974.
3. A.S. Eve and Keys, D. A, Applied Geophysics, Cambridge University, 1954.

Books for Reference:

1. Gutenberg, Physics of the Earth's Interior, International Geophysics Series, Vol.1 Academic Press, 1959.
2. P.J. Wyllie, International Student Edition., The dynamic Earth, John Wiley and sons, 1971.
3. C.M.R. Fowler, The Solid Earth, An Introduction to Global Geophysics, Cambridge University

Course Learning Outcome (CLOs)

CLO	Course Learning Outcome

Knowledge level

CLO1 Enlighten the concept solar system. **K1. K3**

CLO2 Understand principle and method of measuring gravity. **K1, K2, K3**

CLO3 Think and analyze the concept of the Earth and its properties. **K2, K5**

CLO4	Accumulate the various concept proposed by theories and laws	K3, K4, K5

CLO5	Acquire basic knowledge about geomagnetism and paleomagnetism.	K5, K6

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓			✓		✓	✓	✓
CLO2	✓	✓		✓		✓	✓	✓
CLO3	✓			✓		✓	✓	✓
CLO4	✓	✓		✓		✓	✓	✓
CLO5	✓			✓		✓	✓	✓

Number of matches = 27, Correlations: High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYPR11	DSEI	PRACTICAL I- GENERAL PHYSICS EXPERIMENTS	5	4

Course Objectives

Aim of General Physics Lab is to train the students for techniques in Physics so that they can investigate various relevant aspects and be confident to handle sophisticated instruments. To make the students to understand experimental physics is a natural extension of the theoretical concepts of Physics. Students will cherish that the laboratory experiments are set in consonance with the topics covered in theory like Lasers, Meyer's disc. F. P. Etalon using spectrometer, Arc spectrum, B-H curve etc. The purpose of doing laboratory experiments by the students is to afford an opportunity to familiarize themselves with various instruments, which they read in theory and to culture the habit of taking readings carefully, so as to get the results nearer to the already determined standard values with least error. The student is made to understand the physical principles underlying the experiment undertaken.

LIST OF EXPERIMENTS

(Any 15 out of the given 25)

1. Cornu's method – Young's modulus by elliptical fringes.
2. Cornu's method – Young's modulus by hyperbolic fringes.
3. Determination of Stefan's constant.
4. Band gap energy – Thermistor.
5. Hydrogen spectrum – Rydberg's constant.
6. Co-efficient of linear expansion-Air wedge method.
7. Permittivity of a liquid using RFO.
8. Viscosity of liquid – Meyer's disc.
9. Solar spectrum – Hartmann's interpolation formula
10. F.P. Etalon using spectrometer.
11. Iron /Copper arc spectrum.
12. Brass / Alloy arc spectrum.
13. B-H Loop using Anchor ring.
14. Specific charge of an electron – Thomson's method /Magnetron method.
15. Electrical resistance of a metal /alloy by four probe method.
16. Edser and Butler fringes – Thickness of air film.
17. Spectrometer – Polarisability of liquids.
18. Spectrometer – Charge of an electron.
19. Determination of strain hardening coefficient.
20. Thickness of the enamel coating on a wire – by diffraction.

By the end of the semester, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CL01	Comprehend the concept of the experiment. Evaluate theoretical calculations using experimental observations.	K2, K3, K5
CL02	Analyze the data and arrive at a valid conclusion. Apply computational thinking.	K4, K5
CL03	Ability to analyze various spectra and identify the molecules by their spectra. Experimental skill development by performing basic spectroscopic measurements	K4, K5
CL04	Determine the different laser parameters using the methods involved in Laser beam technique.	K4, K5
CL05	Learn various experimental for developing analytical abilities to address real world problems.	K5, K6

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓	✓	✓			✓	✓	
CLO2	✓	✓	✓			✓	✓	
CLO3	✓	✓	✓		✓	✓	✓	✓
CLO4	✓	✓	✓	✓	✓	✓	✓	
CLO5	✓	✓	✓			✓	✓	✓
Number of matches = 30, Correlations: High								

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY2001	DSC5	STATISTICAL PHYSICS	6	5

Course Objectives

To review the fundamental concepts of thermodynamics, micro and macro ensembles, Bose-Einstein, Fermi - Dirac Statistics, Ising model and Fluctuations and their problems

Unit-I		12 Hours
Thermodynamic potentials and Maxwell's relations- Chemical potential- Entropy and probability- Micro and macro states-phase space- Liouville's theorem.		
Unit-II		12 Hours
Microcanonical ensemble- ideal gas- Gibbs paradox - canonical ensemble- grand canonical ensembles-Comparison of various ensembles-Canonical and grand canonical partition function- Molecular partition function - Translational partition function- Rotational partition function - Vibrational partition function- Applications.		
Unit-III	Bose-Einstein Statistics	12 Hours
Ideal Bose gas - Thermodynamic properties - statistics of ensembles - black body radiation - phonons - Debye's theory of specific heat - BE condensation- Liquid helium.		
Unit-IV	Fermi Dirac Statistics	12 Hours
Ideal Fermi gas - Fermi Dirac distribution - thermodynamic properties - electron gas in metals - electronic heat capacity - Pauli's paramagnetic susceptibility- white dwarfs.		
Unit-V	Phase transition and Ising model	12 Hours
Phase transitions-Thermodynamic stability, free energy- First and second order phase transitions, Continuous phase transition- Ising model- Spin $\frac{1}{2}$ Ising model- ground state configuration-One dimensional Ising model- two dimensional Ising model- Application of spin $\frac{1}{2}$ Ising model -Landau's theory of phase transition		

Books for Study:

1. B.K. Agarwal and M. Eisner, 1998, Statistical Mechanics, 2nd Edition, New

1. K. Huang, 1975, Statistical Mechanics, Wiley Eastern Ltd., New Delhi.
2. H.B.Callen, John Wiley Thermodynamics and An Introduction to Thermostat
3. J. K. Bhattacharjee, 1996, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi.

By the end of the course, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CLO1	Analyze the concepts of microstate and macrostate of a model system	K1, K2, K3
CLO2	Understand the concept of ensembles and their comparison and apply the concept of partition function to obtain macroscopic properties of thermodynamic systems	K1, K2, K3, K4
CLO3	Apply Bose Einstein statistic for ideal gas, understand the thermodynamic properties	K3, K4, K5
CLO4	Apply Fermi Dirac statistic for Fermions	K3, K4, K5
CLO5	Understand the behavior of molecule at very low temperature	K1, K2, K4

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓	✓	✓					
CLO2	✓	✓	✓	✓	✓		✓	
CLO3	✓	✓	✓	✓	✓		✓	
CLO4	✓	✓	✓	✓	✓		✓	
CLO5	✓	✓	✓	✓			✓	

Number of matches = 26, Correlations: High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY2002	DSC6	ELECTROMAGNETIC THEORY & PLASMA PHYSICS	6	5

Course Objectives

Objective: To introduce the laws governing the distribution and propagation of electromagnetic fields created by static and dynamic charges of distributions and their interaction with matters.

Unit-I	ELECTROSTATICS	12 Hours
Poisson's and Laplace equation – Boundary conditions and Uniqueness theorem –Green Reciprocity theorem - Laplace equation in three dimension – Solution in cartesian and spherical polar coordinates – boundary value problems.		
Unit-II	MACROSCOPIC MEDIA	12 Hours
Polarization and displacement vectors - Boundary conditions on field vectors - Dielectric sphere in a uniform field –Electrical susceptibility and Dielectric constant – Electrostatic energy in the presence of dielectric – Electric Quadrupole - Multipole expansion – Molecular field in a dielectric. The Clausius-Mossotti Relation.		
Unit-III	MAGNETOSTATICS	12 Hours
Biot-Savart Law - Ampere's law – Magnetic scalar and vector potential and magnetic field of a localised current distribution - Magnetic moment, force and torque on a current distribution in an external field - Magnetostatics energy - Magnetic induction and magnetic field in macroscopic media - Boundary conditions - Uniformly magnetized sphere.		
Unit-IV	MAXWELL EQUATIONS AND ITS APPLICATIONS	12 Hours
Faraday's laws of Induction - Maxwell's displacement current - Maxwell's equations - Vector and scalar potentials - Gauge invariance - Wave equation and plane wave solution- Coulomb and Lorentz gauges - Poynting's theorem - Lorentz force.		

Unit-V	PLASMA PHYSICS	12 Hours
Plasma Oscillations -Elementary concepts- Debye Shielding - Magneto-Hydrodynamics- equation of state for the fluid- Electromagnetic and mechanical behaviour of fluid- Pinch Effect-Average pressure for a cylindrical plasma- Plasma wave.		
Books for Study: 1. D. J. Griffiths, 2002, <i>Introduction to Electrodynamics</i>, 3rd Edition, Prentice-Hall of India, New Delhi. 2. J. R. Reitz, F. J. Milford and R. W. Christy, 1986, <i>Foundations of Electromagnetic Theory</i>, 3rd edition, Narosa Publication, New Delhi. 3. J. D. Jackson, 1975, <i>Classical Electrodynamics</i>, Wiley Eastern Ltd. New Delhi. 4. J. A. Bittencourt, 1988, <i>Fundamentals of Plasma Physics</i>, Pergamon Press, Oxford. 5. Satya Prakash, <i>Electromagnetic Theory and Electrodynamics</i>, (Kedar Nath Ram Nath, Meerut, 2015)		
Books for Reference: 1. W. Panofsky and M. Phillips, 1962, <i>Classical Electricity and Magnetism</i>, Addison Wesley, London. 2. J. D. Kraus and D. A. Fleisch, 1999, <i>Electromagnetics with Applications</i>, 5th Edition, WCB McGraw-Hill, New York. 3. B. Chakraborty, 2002, <i>Principles of Electrodynamics</i>, Books and Allied, Kolkata. 4. R. P. Feynman, R. B. Leighton and M. Sands, 1998, <i>The Feynman Lectures on Physics</i>, Vols. 2, Narosa, New Delhi.		
Course Learning Outcome (CLOs) By the end of the course, the students will be able to		
CLO	Course Learning Outcome	Knowledge level
CLO1	Study the mathematical terms of Laplace equation and electrostatics	K1, K2, K3
CLO2	Evaluate the electrostatic energy in the presence of Dielectric	K2, K3, K4
CLO3	Study the dynamic charge distribution in magnetostatics and boundary conditions.	K2, K3, K4
CLO4	Understand the Faraday's laws of induction and solve Maxwell equations	K3, K4, K5
CLO5	Grasp the idea of Plasma and confinement of plasma of its own magnetic field	K1, K3, K5

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓	✓	✓	✓		✓	✓	
CLO2		✓	✓	✓		✓	✓	
CLO3	✓	✓	✓	✓		✓	✓	
CLO4			✓	✓		✓	✓	
CLO5	✓	✓	✓	✓	✓		✓	
Number of matches = 27, Correlations: High								

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPY2003	DSC7	QUANTUM MECHANICS II	6	4

Course Objectives

To introduce the physical concepts and mathematical formalism of scattering theory, time dependent perturbation theory, its applications, Relativistic Quantum Mechanics, Dirac equation and Quantization of Schrodinger's and Dirac field.

Unit-I	Perturbation theory	12 Hours
Time-independent perturbation theory - non-degenerate level & Degenerate Level- Stark Effect-Variational method -Ground state of Helium-WKB method and its applications-probability of penetration of a barrier.		
Unit-II	Time-dependent perturbation theory	12 Hours
Time-dependent perturbation theory-Transition probability- Fermi GoldenRule - adiabatic approximation -Sudden approximation -charged particle in the electromagnetic field-Emission and absorption of radiation -electric dipole approximation.		
Unit-III	Scattering	12 Hours
Definition of Cross-sections - Differential scattering & total scattering cross-sections- -scattering amplitude- General formulation of the scattering theory- -Born		

approximation –condition for the validity of Born approximation-. Partial wave analysis- Optical theorem.

Unit-IV	Relativistic Wave equation	12 Hours

Klein-Gordon equation in electromagnetic fields-Charge and current density-Dirac relativistic wave equations-Properties of Dirac Matrices- Plane wave solutions of Dirac equation- interpretation of negative energy states-**Electromagnetic potentials - magnetic moment of the electron- existence of electron spin.**

Unit-V	Quantum field theory	12 Hours

Quantum field theory-creation and annihilation operators-space and time in the relativistic quantum theory- Dirac equation-plane wave solution- positive and negative energy spinors-Representation of Gamma Matrices-Traces-second quantization of Klein- Gordon field- second quantization of Dirac field.

Books For Study:

1. **Sathya Prakash** And **Swathi Saluja**, 2002, *Quantum Mechanics*, Kedar Nath Ram Nath & Co, Meerut.
2. **Amitabha Lahiri** And **Palash B Pal**, 2002, *A First Book Of Quantum Field Theory*, Narosa Publishing House, New Delhi.
3. **P. M. Mathews** And **K. Venkatesan**, 1976, *A Text Book Of Quantum Mechanics*, Tata McGraw-Hill, New Delhi.
4. **L. I. Schiff**, 1968, *Quantum Mechanics*, 3rd Edition, International Student Edition, Macgraw-Hill Kogakusha, Tokyo.
5. **E. Merzbacher**, 1970, *Quantum Mechanics*, 2nd Edition, John Wiley And Sons, New York.
6. **V. K. Thankappan**, 1985, *Quantum Mechanics*, 2nd Edition, Wiley Eastern Ltd, New Delhi.
7. **J.D. Bjorken** And **S.D. Drell**, 1964, *Relativistic Quantum Mechanics*, Macgraw-Hill New York.
8. **Gupta, Kumar & Sharma**, 2017- *Quantum Mechanics*, Jai Prakash Nath Publications, Meerut

Books for Reference:

1. **P. A. M. Dirac**, 1973, *The Principles of Quantum Mechanics*, Oxford University Press, London.
2. **L. D. Landau** and **E. M. Lifshitz**, 1958 *Quantum Mechanics*, Pergomon Press, London.
3. **S. N. Biswas**, 1999, *Quantum Mechanics*, Books and Allied, Kolkata.
4. **G. Aruldas**, 2002, *Quantum Mechanics*, Prentice-Hall of India, New Delhi.
5. **J. S. Bell**, **Gottfried** and **M. Veltman**, 2001, *The Foundations of Quantum Mechanics*, World Scientific.

6. **V. Devanathan**, 1999, *Angular Momentum Techniques in Quantum Mechanics*, Kluwer Academic Publishers, Dordrecht.

Course Learning Outcome (CLOs)

By the end of the course, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CLO1	Applications of various approximation methods in solving the Schrodinger equation	K2, K3, K4
CLO2	Apply the perturbation theory to scattering matrix and partial wave analysis. Compare and analyse the different approximation methods	K2, K3, K4
CLO3	Understand the concept of Scattering cross-section, scattering amplitude of Born approximation and partial wave analysis method	K1, K3, K4, K5
CLO4	Grasp the central concept and principles of Relativistic Quantum Mechanics and solve problems	K3, K4, K5
CLO5	Understanding the concept of quantum field theory and differentiate between the second quantization of Klein- Gordon field and Dirac field	K4, K5

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓	✓	✓		✓		✓	✓
CLO2	✓	✓	✓		✓		✓	
CLO3	✓	✓	✓		✓		✓	
CLO4	✓	✓	✓	✓	✓	✓	✓	
CLO5	✓	✓	✓		✓	✓	✓	

Number of matches = 29, Correlations: High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE21	DSE2	MOLECULAR SPECTROSCOPY	6	4

Course Objectives

To understand the interaction of radiation with matter leading to the different type of spectroscopy. To comprehend the theory of Rotational and Vibrational spectroscopy. Working principles, outline device construction and applications of NMR. The methods to interpret UV-Vis spectroscopy is explained. Apply the spectroscopic techniques for the qualitative and quantitative analysis of various chemical compounds. Realize the applications of spectroscopy in various fields.

Unit-I	MOLECULAR SYMMETRY	12 Hours

Molecular symmetry and Group Theory. Matrix Representations of symmetry elements of a Point Group. reducible and irreducible Representations, Character Tables for C_{2v} and C_{3v} point groups- The great orthogonality theorem- **Normal modes of vibration and their distribution into symmetric species of the molecule- Molecular orbital for σ bonding in the tetrahedral AB_4 case- Molecular orbital for π bonding AB_n Molecules.**

Unit-II	INFRARED SPECTROSCOPY	12 Hours

Vibrations of diatomic molecule-**Diatomic vibrating rotator-Vibration -Rotation spectrum of Carbon monoxide- Breakdown of the Born-Oppenheimer approximation-the interaction of rotations and vibrations-** Vibration of polyatomic molecules- **Spectra of polyatomic molecules-** IR Instrumentation techniques – principle, construction and working of FT-IR spectrometer

Unit-III	RAMAN SPECTROSCOPY	12 Hours

Vibrational and Rotational Raman spectra – Classical theory of Raman scattering- Quantum Theory of Raman scattering-Mutual Exclusion principle – Raman spectrometer – Polarization of Raman Scattering light. Structure Determination using IR and Raman spectroscopy – Phase transitions – Resonance Raman Scattering - Raman Microscopy.

Unit-IV	NMR AND NQR SPECTROSCOPY	12 Hours
Quantum theory of NMR – Bloch equations – Design of NMR Spectrometer – Chemical Shift – Application to molecular structure. Theory of NQR – Nuclear Quadrupole energy levels for axial and non-axial symmetry – Experimental techniques and applications.		
Unit-V	ESR AND MOSSBAUER SPECTROSCOPY	12 Hours
Quantum Theory of ESR – Design of ESR Spectrometer – Hyperfine Structure – Anisotropic systems of g-factors – Systems in Triplet state Mossbauer effect – Recoilless emission and absorption – Mossbauer spectrum – Experimental techniques – Mossbauer spectrometer- Magnetic Hyperfine interactions – Chemical Isomer shift – Crystal symmetry and Magnetic structure – Surface studies.		
Books for Study: 1. F.A. Cotton, 1990, Chemical Applications of Group Theory, 3rd Edition, John Wiley & Sons, United State of America. 2. C. N. Banwell and E. M. McCash, 1994, Fundamentals of Molecular Spectroscopy, 4th Edition TMH, New Delhi. 3. G. Aruldas, 2001, Molecular Structure and Spectroscopy, Prentice Hall of India Pvt. Ltd. New Delhi. 4. Gurdeep Chatwal & Sham Anand, Spectroscopy (Atomic and Molecular) Himalaya Publishing house 5. S. D. Walker & B. P. Straughan 1976, Spectroscopy, Halsted Press		
Books for Reference: 1. D. D. Jyaji and M. D Yadav 1991, Spectroscopy, Amol Publications 2. Atta ur Rahman, 1986, Nuclear Magnetic Resonance, Springer Verlag. 3. D. A. Lang, Raman Spectroscopy, McGraw-Hill International 4. Raymond Chang, 1980, Basic Principles of Spectroscopy McGraw-Hill Kogakusha, Tokyo.		

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE22	DSE2	ASTROPHYSICS	6	4

Course Objectives

Objective: To provide an introduction to stellar structure and evolution, and to enhance the knowledge about Nuclear Astro Physics, Stellar objects & Stellar explosions, Gravitational collapse and relativistic astrophysics and formation of Accretion disks

Unit-I	Astronomical theory	12 Hours
Birth of Modern Astronomy - Geocentric and Heliocentric theories - Kepler's laws of planetary motion - Newtonian gravitation - Celestial sphere - Planets - Terrestrial and Jovian planets (Planets individual description is not required in detail) - Asteroids- Meteoroids - Comets.		
Unit-II	Astronomical Instruments	12 Hours
Telescopes - Elements of telescope - Properties of images - Types of Optical telescopes - Refracting and Reflecting telescopes- Radio telescope - Sunlight and Spectroscopy - Electromagnetic spectrum - Spectrograph - Limitations - Photographic photometry - Photoelectric photometry - Spectrophotometry - Detectors and image processing.		
Unit-III	Sun and Earth	12 Hours
Sun - Physical properties - Composition - Core - Nuclear Reactions - Photosphere - Chromosphere - Corona - Sunspots - Sunspot cycle - Solar Wind - Solar flares - Coronal Mass Ejections - Solar Prominences - Auroras - space weather effects - History of the Earth - Temperature of a planet - The atmosphere - Pressure distribution - Temperature distribution - Magnetosphere - Eclipses - Solar and Lunar Eclipses		
Unit-IV	Classification of Stars	12 Hours
Classification of Stars - The Harvard Classification system - Luminosity of a Star - Hertzsprung-Russell Diagram - Stellar evolution using the HR diagram - Theoretical evolution of stars - White Dwarfs - Neutron stars - Black holes - Event horizon - Basic physics of Black Holes - Neutron stars - Pulsars.		
Unit-V	Galaxies	12

		Hours
Galaxy nomenclature – Types of Galaxies – Spiral – Elliptical – irregular galaxies – Milky Way Galaxy and its structure – Rotation and Mass Distribution – Rotation curve and Doppler shift – Star clusters – Galactic clusters – Cosmological Models – Big bang theory – Steady state theory – Hubble's law – Olber's paradox – Interstellar extinction – Dark matter.		
Books for Study:		
1.A. Mujiber Rahman, Concepts of Astrophysics, Scitech Publications, Chennai, 2018.		
2.Abell, Morrison and Wolf, Exploration of the Universe, 5th ed., Saunders College Publications, UK, 1987		
3.Textbook of astronomy and astrophysics with elements of cosmology, V.B.Bhatia, Narosa publishing house, 2001.		
Books for Reference:		
1. Carroll and Ostlie, Introduction to Modern Astrophysics, 2nd ed., Pearson International, UK, 2007.		
2. William J. Kaufmann, III, Macmillan Publishing company, London.		
3. General Relativity, Astrophysics and Cosmology – A.K.Raychaudhuri, S.Banerji and A.Banerjee (Springer-Verla, 1992)		
4. General Relativity and Cosmology – S. Banerji and A. Banerjee (Elsevier, 2007)		
5. The Structure of the Universe – J.V.Narlikar (OUP, 1978)		
Course Learning Outcome (CLOs)		
By the end of the course, the students will be able to		
CLO	Course Learning Outcome	Knowledge level
CLO1	Understand basic ideas of Astronomical bodies like Terrestrial, Jovian planets Asteroids and Meteoroids	K1, K2, K3
CLO2	Understand the various Astronomical Instruments	K3, K4, K5
CLO3	Gain basic ideas about the earth, sun, atmosphere, magnetosphere and eclipses	K2, K4, K5
CLO4	Study the Classification of Stars	K3, K4, K5
CLO5	Understand the nomenclature of galaxies its various types and Cosmological Models	K2, K4, K5

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓	✓	✓		✓		✓	
CLO2	✓	✓	✓		✓	✓	✓	
CLO3	✓			✓	✓			
CLO4		✓	✓	✓	✓			✓
CLO5		✓	✓				✓	✓
Number of matches = 23, Correlations: Moderate								

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYDE23	DSE2	ENERGY PHYSICS	6	4

Course Objectives

- To create an awareness among the students regarding the forms of energy and the availability of their resources
- To educate regarding the utilization and conservation of energy
- To impart a knowledge about the Sustainable forms of energy

Unit-I	CONVENTIONAL ENERGY SOURCES	12 Hours
Energy sources and their availability – Various forms of energy – Renewable and conventional energy systems – Comparison – Coal, oil and natural gas.		
Unit-II	SOLAR ENERGY	12 Hours
Solar Energy - Thermal application and solar radiation – Energy alternatives – Devices for thermal collection and storage – Thermal applications – Water heating – Space heating – Power generation – Instruments for measuring solar radiation and sun shine.		
Unit-III	ENERGY STORAGE	12 Hours
General characteristics - Definitions - Methods of classifications - Thermal energy storage - Sensible heat storage - Liquids - Solids – Latent heat storage - Thermal chemical storage.		
Unit-IV	PHOTO CONVERSION	12 Hours

Photovoltaic conversion - Principle and working of solar cells - Conversion efficiency -Single crystal and Polycrystalline silicon - Cadmium sulphide - Cadmium telluride.

Unit-V	SUSTAINABLE FORMS OF ENERGY	12 Hours

Reserves of Energy Resources – Environmental aspects of energy extraction, conversion and utilization – challenges associated with the non-sustainable energy sources -hydrogen storage system, principle, operation and system components-comparisons among energy uses, resources, and technologies-technical and economic challenges in the integration of sustainable energy form-potential solutions and application.

Books for Study:

1. P. Sukhatme, Solar energy, Tata McGraw-Hill, (Second edition), 2008.
2. D.P. Kothari, K.C. Singal and Rakesh Ranjan, Renewable energy sources and emerging Technologies, Prentice Hall of India, 2008.
3. S.A. Abbasi and Nasema Abbasi, Renewable Energy sources and their Environmental Impact, PHI Learning Pvt. Ltd., 2008.
4. M.P. Agarwal, Solar Energy, S. Chand & Co, 1983.
5. S.P. Sukhatme, Solar Energy, TMH, 1996.
6. G.D. Rai, Non-conventional Energy sources, Khauna Publication, 2004.

Books for Reference:

1. John Twidell & Tony Weir, Renewable Energy Resources Taylor & Francis Group, 2006.
2. Kreith and Kreider, Principles of Solar Engineering, McGraw Hill Pub, 1978.
3. A.B. Meinel and A.P. Meinel, Applied Solar Energy, 1976.

Course Learning Outcome (CLOs)

By the end of the course, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CLO1	Be aware of various forms of energy and the effective utilization of their resources.	K1, K2
CLO2	Be exposed to the practical usage of solar energy.	K2, K3, K4
CLO3	Be exposed to the practical usage of thermal energy.	K1, K4
CLO4	Acquire an in-depth knowledge about the sustainable forms of energy.	K1, K4, K5
CLO5	Gain the knowledge of hydrogen fuel and its production	K2, K4, K6

Course Learning Outcomes (CLOs)	Programme Learning Outcomes (PLOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PLO8
CLO1	✓			✓		✓	✓	✓
CLO2	✓			✓		✓	✓	✓
CLO3	✓			✓		✓	✓	✓
CLO4	✓	✓		✓		✓	✓	✓
CLO5	✓			✓		✓	✓	✓
Number of matches = 26, Correlations: High								

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
PBPYPR21	DSE2	PRACTICAL II-ELECTRONICS EXPERIMENTS	5	4

Course Objectives

To develop an understanding of fundamentals of electronics in order to rehash the understanding of electronic devices that are part of the technologies that surround us. This course provides a comprehensive understanding of electronic devices and circuits. Students will have an understanding of various theoretical circuits being realized in real. Basic concepts of semiconductors, behavior of FETs and op-amps is emphasized. This course also helps to design simple circuits using op-amps, integrated circuits, know the principle in these methods and to inculcate strong laboratory skills to take up independent projects. To comprehend and compare the different characteristics of semiconductor devices and their various applications setting the base for research work. The students are trained to be confident to troubleshoot the circuit and apply a graphical analysis to the experimental data

LIST OF EXPERIMENTS

(Any 15 out of the given 20)

1. Characteristics of UJT and Relaxation Oscillator.
2. FET Characteristics and FET amplifier.
3. Op-Amp – Inverting, Non- inverting amplifier – Voltage follower summing, difference, average amplifier – differentiator and integrator,
4. Op-Amp – Study of the attenuation characteristics and design of the phase shift-Oscillator.
5. Op-Amp –Study of the attenuation characteristics and design of the Wien Bridge Oscillator.

6. Op-Amp – Solving simultaneous equations.
7. Op-Amp – Design of square wave, saw tooth wave and Triangular wave generators.
8. Op-Amp – Design of Schmitt Trigger and construction of Monostablemultivibrator.
9. Op-Amp – Design of active filters – second order –Low pass, high pass, band pass and band rejecter.
10. Op-Amp – D/ A converter - Binary weighted method - R-2R Ladder method.
11. IC7400 – Half adder, Half subtractor, Full adder, Full subtractor.
12. IC 7490 – modulus counters- Using Seven segment with IC 7447
13. Up-down counters – Design of modulus counters.
14. 4 bit Shift Registers – Ring counter – Twisted Ring counter.
15. IC 7483 – Arithmetic Operations.
16. IC 555 – Astablemultivibrator and Voltage Controlled Oscillator.
17. IC 555 – Monostablemultivibrator, Frequency Divider.
18. IC 555 – Schmitt Trigger and Hysteresis.
19. IC 7400 & IC 7413 - Clock generators.
20. Temperature co-efficient using 555 timers.

Course Learning Outcome (CLOs)

By the end of the course, the students will be able to

CLO	Course Learning Outcome	Knowledge level
CLO1	Basic laws and theories involving amplifiers, integrated circuits, converters and flip flopsetc.,	K1, K2, K3
CLO2	Apply the theory to design the basic electrical circuits	K3, K4, K5
CLO3	Understand the operation of several digital circuits both combinational and sequential	K3, K4, K5
CLO4	comprehend and compare the different characteristics of semiconductor devices and their various applications	K3, K4, K5
CLO5	Solve simultaneous equations, perform D/A conversion using Op-amp	K3, K4, K5

DEPARTMENT OF CHEMISTRY
UG & PG SYLLABI

PROGRAMME OUTCOME FOR B.Sc.

PO1	Communicate in English, the ideas, findings, and results effectively through conversations, meetings, and reports, especially through digital means. Develop linguistic skills in one Indian/Regional language
PO2	Demonstrate knowledge of the concepts, principles, theories, and techniques of the domain and allied subject areas.
PO3	Synergies knowledge with Analytical & Experimental skills to systematically, create & run programs/carry out experiments/formulate & prove theories to enrich the body of knowledge
PO4	Synthesize learned knowledge and acquired skills to Identify and critically analyze pertinent problems in the relevant discipline using appropriate tools and techniques.
PO5	Exhibit potential to accomplish tasks independently or as a member or leader of a team
PO6	Utilize specialized instruments and equipment, Computers, Software, Internet, and other ICT tools to carry out experiments
PO7	Demonstrate knowledge and scientific understanding to design experiments, use appropriate methodologies, analyze and interpret data and provide solutions, and Exhibit organizational skills, and the ability to manage time and resources.
PO8	Create Compounds/Products/Software or Design experiments and/or collaborate to help Society in building a Sustainable Environment
PO9	Discover a passion for Lifelong Learning through MOOCs, ODL, and Self -Learning techniques through optimum use of ICT
PO10	Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

[illegible]

PSO6	✓	✓	✓	✓	✓	✓	✓	✓		
PSO7	✓	✓	✓	✓	✓	✓	✓	✓		✓
PSO8	✓	✓	✓	✓	✓	✓	✓	✓		✓
Number of matches = 73, Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

PROGRAMME SPECIFIC OUTCOMES (PSO) On completion of the B.Sc Chemistry Programme, the students will be able to:

- PSO1** Utilize his knowledge and interest after studying chemistry as a discipline by summarizing the basic facts and concept learnt from theory and practical work.
- PSO2** Apply principles, theories and technique of the core subjects to other discipline.
- PSO3** Apply the recent developments in chemistry to the welfare of nature and society.
- PSO4** Get job opportunities as a chemist by his understanding over industrial process development and their applications.
- PSO5** Pursue his higher education in various inter disciplinary subjects connected with technology and research.
- PSO6** Handle chemicals, apparatus and instruments by proper analytical tools.
- PSO7** Solve the problems arising out of industrial production and environmental pollution.
- PSO8** Explore the knowledge of reactions, processes and their applications as an entrepreneur.

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCH1001	Discipline Specific Core Course	GENERAL CHEMISTRY - I	3	3
Course Objectives				
Basic concepts regarding periodic properties, bonding concepts, solids, gases, nomenclature, reactions, mechanism of organic compound and inorganic analysis are to be taught for I-Semester.				
Unit-I	Periodic Properties			9 Hours
1.1	Periodicity of properties – Atomic and ionic radii – factors affecting atomic and ionic radii – Ionization potential – factors affecting ionization potential			
1.2	Electron affinity-factors affecting electron affinity – Electronegativity – factors affecting electronegativity – Pauling scale – Mulliken electro negativity scale – Alfred and Roschow scale.			
Unit-II	Nomenclature and Bonding of Organic Compounds			9 Hours
2.1	Classification and Nomenclature of organic compounds – Homologous series – IUPAC recommendations for naming simple aliphatic – Alicyclic and aromatic compounds – Polyfunctional compounds			
2.2	Bonding in organic chemistry – Hybridisation – geometry of molecules – Methane, Ethane, Ethylene and Acetylene. Electron displacement affects – inductive –mesomeric – electromeric – resonance – hyperconjugation and steric effects			
Unit-III	Gaseous State			9 Hours
3.1	Gaseous state – Kinetic gas equation – derivation – Gas laws from the kinetic gas equation – Maxwell's distribution of molecular velocities [no derivation] – Effect of temperature on velocity distribution kinds of velocities – mean, RMS and most probable velocities			
3.2	Real gases – Compressibility factor- van-der-Waal's equation (No derivation), Virial equation of state. Liquefaction of gases – Joule Thomson Effect – its coefficient and derivation. Inversion Temperature.			
Unit-IV	Analytical Chemistry			9 Hours
4.1	Inorganic analysis – Semimicro techniques – Principles of acid-base equilibria – common ion effect – Solubility product and their applications in qualitative analysis.			
4.2	Reactions involved in the separation and identification of cations and anions in the analysis – Spot test reagents-Aluminon, Cupferon, DMG, Thiourea, Magneson, Alizarin and Nessler's reagent			
Unit-V	Solid State			9 Hours
5.1	Solid State – Laws of crystallography- Elements of symmetry - Crystal systems - Unit cell - Crystal lattices – crystal systems – unit cell – space lattice – Bravais's lattices – Miller's indices.			

5.2	Simple cube, Body centered cube and face centered cube - structure of NaCl, And CsCl
Books for Study 1. Text book of Organic Chemistry by ArunBahl& B.S. Bahl - S.Chand. 2. Text book of Inorganic Chemistry by P.L. Soni – S. Chand. 3. Principles of Physical Chemistry by Puri, Sharma – Vishal Publication. 4. Advanced Organic Chemistry by Morrison & Boyd. 5. Text book of Inorganic Chemistry by R.D. Madan	
Books for Reference: 1. Advance Organic Chemistry by I.L. Finar. 2. Advance Inorganic Chemistry by J. D. Lee. 3. Physical Chemistry by S.Glasstone.	

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Predicts atomic structure and chemical properties of the elements based on their position in the periodic table	K2, K3, K4
CO2	Identify the physical and chemical properties of common organic functional groups	K2, K3
CO3	Illustrate the theories of ideal and real gases	K1, K2
CO4	Apply qualitative analysis to detect the groups based on solubility product.	K4, K5
CO5	Determine the crystalline structure of compounds.	K5
KI- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓	✓	✓		✓
CO2	✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓		
CO4	✓	✓			✓	✓	✓	

CO5	✓	✓	✓		✓	✓		
Number of matches = 28, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
	Discipline Specific Core Practical	SEMIMICRO ANALYSIS OF SIMPLE SALT AND COMPLEX PREPARATION	3	-
Course Objectives				
Analysis of inorganic salt containing one anion and one cation. Semi-micro method using the conventional scheme to be adopted.				
Cation and anion of the simple inorganic salt to be studied				
Lead, Copper, Cadmium, Bismuth, Iron, Nickel, Zinc and Ammonium. Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide.				
Preparation of Inorganic Compounds				
1. Tris (thiourea) copper I chloride 2. Potassium trioxalato ferrate (II) 3. Chloropentammine cobalt (III) chloride				
Books for Study				
1. Basic Principles of Practical Chemistry - V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.				
Books for Reference:				
1. Basic Principles of Practical Chemistry - V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.				

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Prepare simple inorganic complexes from metals and ligands.	K4, K5
CO2	Analyse cations present in the inorganic salt qualitatively.	K4
CO3	Identify the groups of cations of inorganic salt on solubility basic by experiments.	K3
CO4	Analyse presence of anion in the simple inorganic salt.	K4
CO5	Carry out semi micro analysis in the laboratory level.	K2, K3
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓			✓	✓	✓	✓	
CO2	✓	✓		✓	✓	✓	✓	✓
CO3	✓			✓	✓	✓	✓	
CO4	✓		✓	✓	✓	✓	✓	✓
CO5	✓			✓	✓	✓	✓	
Number of matches = 29, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCH2001	Discipline Specific Core Course	GENERAL CHEMISTRY -II	6	3
Course Objectives				
Basic concepts regarding ionic bond, covalent bond, cyclo alkanes, dienes, derivation of equations, related problems, mechanism and applications.				
Unit-I	Chemical Bonding - I			18 Hours
1.1 Ionic bond – Electronic theory of valence – Conditions for the formation of ionic bond – Radius ratio rule and its limitations – Energetics of formation of NaCl from Na and Cl – Hydration energy and lattice energy and their applications – Born - Haber cycle. Fajan’s rules – Characteristics of electrovalent compounds.				
1.2 Valence bond theory – Conditions for the formation of covalent bond – General properties – Polarity of bonds – Orbital overlap - Bond lengths and bond energies – hybridization – sigma and pi bonds.				
Unit-II	Chemical Bonding - II			18 Hours
2.1 VSEPR theory geometries of BO_3^{3-} , NH_4^+ , ClF_3 , PCl_5 , IF_7 , and XeF_6 molecules – partial ionic character of covalent bond – percentage of ionic character.				
2.2 Molecular orbital concept of bonding (Linear combination of atomic orbitals (LCAO)). Sigma and pi-bonds. MO diagrams of H_2 , Li_2 , Be_2 , B_2 , C_2 , N_2 , O_2 , and their ions wherever possible; Heteronuclear molecules: CO and NO.				
Unit-III	Alkane and its derivative			18 Hours
3.1 Types of organic reactions – Cleavage of bonds - Homolytic and Heterolytic fission of carbon-carbon bond – Methods for determining reaction mechanism – Reaction intermediates – Structure and stability of Carbocations, Carbanions and Free radicals.				
3.2 Alkanes – Methods of preparation of alkanes – Physical and chemical properties of alkanes – Mechanism of free radical substitution in alkanes - Cycloalkanes – preparation– Substitution and ring opening reactions.				
Unit-IV	Quantum Chemistry			18 Hours
4.1 Quantum chemistry— Planck’s theory – Photoelectric effect - Compton effect- de Broglie’s relationship – Heisenberg’s uncertainty principle - wave nature of electron				
4.1 Schrodinger wave equation [No derivation] – Significance of wave functions, ψ and ψ^2 – probability distribution of electrons – radial probability distribution curves. Quantum numbers Pauli’s exclusion principle – Hund’s rule– Aufbau’s Principle				
Unit-V	Gaseous and Liquid State			18 Hours
5.1 Gaseous state - Collision Diameter, Collision frequency, mean free path – transport properties- viscosity – thermal conductivity – diffusion – equipartition of energy – heat capacity on molecular basis- Boyle temperature – coefficient of compressibility and thermal				

expansion

5.2 Liquid state – Density – Boiling point - Vapour pressure – Viscosity –Surface tension – effect of temperature on surface tension – parachor – definition and applications only – Coefficient of viscosity – effect of temperature – effect of pressure

Books for Study

1. Text book of Organic Chemistry by ArunBahl & B.S. Bahl - S.Chand.
2. Text book of Inorganic Chemistry by P.L. Soni – S. Chand.
3. Principles of Physical Chemistry by Puri, Sharma – Vishal Publication.
4. Advanced Organic Chemistry by Morrison & Boyd.
5. Text book of Inorganic Chemistry by R.D. Madan

Books for Reference:

1. Advance Organic Chemistry by I.L. Finar.
2. Advance Inorganic Chemistry by J. D. Lee.
3. Physical Chemistry by S.Glasstone.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Determine ionic and covalent character of chemical compounds.	K1, K4, K5
CO2	Explain the bonding theories of molecules and ions	K2, K3
CO3	Write the preparation, properties, acidity and uses of alkynes and cycloalkanes	K2, K3, K4
CO4	Understand the principles of behaviour of matter and its interactions in the atomic and molecular levels	K2, K3
CO5	Establish the physical behavior of gases and liquids by identifying their nature.	K4, K5
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓			✓		✓	
CO2	✓	✓			✓	✓	✓	
CO3	✓	✓		✓	✓		✓	
CO4	✓	✓			✓		✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 26, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBCHPR21	Discipline Specific Core Course	SEMIMICRO ANALYSIS OF INORGANIC MIXTURE AND COMPLEX PREPARATION	3	3
Course Objectives				
Analysis of mixture containing two cations and two anions of which one will be an Interfering ion. Semi-micro methods using the conventional scheme to be adopted.				
Cations to be studied				
Lead, Copper, Bismuth, Cadmium, Iron, Aluminium Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.				
Anions to be studied				
Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.				
Preparation of Inorganic Compounds				
1. Tetrammine copper II sulphate 2. Ferrous ammonium sulphate 3. Microcosmic salt				
Mark Distribution				
		ACID RADICALS	20 Marks	
		BASIC RADICALS	20 Marks	
		PREPARATION	20 Marks	
		RECORD	10 Marks	
		VIVA VOCE	05 Marks	
		TOTAL	75 Marks	
Books for Study				
1. Basic Principles of Practical Chemistry - V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.				
Books for Reference:				
1. Basic Principles of Practical Chemistry - V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.				

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Acquires the knowledge of preparation of inorganic complexes by experimental	K1, K2
CO2	Analyse presence of cations in the mixture of inorganic salt qualitatively	K3
CO3	Identify the presence of anions in the salt mixture by qualitatively	K4, K5
CO4	Understand to eliminate interfering anionic radicals	K2, K3
CO5	Apply qualitative analysis to detect and separate as groups of metal ions	K3, K4
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1				✓	✓	✓	✓	✓
CO2	✓			✓	✓	✓	✓	✓
CO3	✓			✓	✓	✓	✓	✓
CO4	✓			✓	✓	✓	✓	✓
CO5				✓	✓	✓	✓	✓
Number of matches = 28, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPYAL11/ UBBIAL11	Other Elective Course	ALLIED CHEMISTRY - I	5	5
Course Objectives				
To learn the concepts of organic, inorganic and physical chemistry.				
Unit-I	Metallurgy			15 Hours
1.1	Extraction of Metal– types of ores – Ore Dressing– Types of Ore Dressing Gravity separation, Froth Floatation and Magnetic separation.-Calcination -Roasting			
1.2	Reduction to free metal-Smelting-Refining of Metals – Types of Refining – Liquation, Electrolytic and Zone Refining. Extraction of copper and nickel.			
1.3	Periodic properties – variation of atomic radii, ionic radii, ionization potential, electron affinity and electro negativity – factor influencing in the periodic table.			
Unit-II	Alkane and Stereochemistry			15 Hours
2.1	Cyclo-alkanes preparation properties of Cyclohexane – Bayers strain theory. Aromaticity – Conditions – Huckel’s rule – benzene.			
2.2	Electromeric effect – Inductive effect, mesomeric effect and steric effect - [Acidity and Basicity of organic compounds.			
2.3	Stereo isomerism – Types, Causes of optical activity of Lactic acid and tartaric acid – Racemisation – Resolution – Geometrical isomerism – maleic and fumaric acid.			
Unit-III	Chemical Kinetics, Catalysis and Photochemistry			15 Hours
3.1	Chemical Kinetics – Distinction between Order and Molecularity – derivation of First order rate equation – half life period of first order reaction – determination of rate constant of hydrolysis of ester.			
3.2	Catalysis – catalyst – auto catalyst – enzyme catalyst – Promoters – catalytic poisoning – Active center – Distinction between homogeneous and heterogeneous catalysts – Industrial application of catalysts.			
3.3	Photochemistry – Grothus Drapers law, Stark Einsteine’s law – quantum yield – phosphorescence – fluorescence – chemiluminescence – photosensitization – Photosynthesis.			
Unit-IV	VSEPR Theory, Naphthalene and Phase rule			15 Hours
4.1	VSEPR Theory – Shapes of simple Molecules BF_3 , PCl_5 SF_6 and XeF_6 .			
4.2	Naphthalene – Preparations, Properties and uses of Naphthalene – Structure of Naphthalene.			
4.3	Phase Rule: Phase, Component, Degree of freedom, Phase Rule – Definition. One component system – Water system.Osmosis - Osmotic pressure – reverse osmosis – desalination of sea water.			
Unit-V	Nuclear Chemistry and Energy			15 Hours
5.1	Nuclear Chemistry – Definition of Half life period – Group displacement law –			

5.2	Radioactive series. Nuclear Fission and Fusion – Applications of nuclear Chemistry in Medicine, agriculture and industries – ^{14}C dating.
5.3	Crude Oil – Petroleum –Refining – Cracking – Fuels – Calorific value of fuels – Non-conventional fuels – need of Solar energy – Applications – Bio-fuels.
5.3	Elements of symmetry – unit cell – crystal lattice – types of cubic lattice – one example for each.
Books for Study	
1. Allied Chemistry by Dr. S. Sundaram	
2. Allied Chemistry by R. Gopalan	
Books for Reference:	
1. Advance Organic Chemistry by Bahl and ArunBahl. 19 th Edition., 2005 - Sulthan Chand company, New Delhi.	
2. Principles of Inorganic Chemistry by B.R. Puri and L.R. Sharma. ShobanLalNagin Chand and Co. New Delhi 2000.	
3. Principles of Physical Chemistry by B.R. Puri, L.R. Sharma and S. Pathania. ShobanLalNagin Chand and Co. New Delhi 2001.	

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Identify the ores and understand the extraction of metals from their ores in metallurgical processes and compare the periodic properties of elements.	K3, K4
CO2	Draw structures for the optical isomers and geometrical isomers of small molecules.	K4, K5
CO3	Derive equations based on the concepts of rate of the chemical reactions and catalysis.	K4, K5
CO4	Apply principles of osmosis and reverse osmosis techniques in purification.	K3, K4
CO5	Work in petroleum refineries and other energy producing industries.	K3, K6
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓			✓	✓	✓	
CO2	✓	✓		✓			✓	
CO3	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 31, Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
	Other Elective Course	ALLIED CHEMISTRY PRACTICAL	3	-
Course Objectives				
To learn the basic techniques of volumetric analysis and organic analysis				
Volumetric Titration -I				
1. Estimation of Sodium Hydroxide using std. Sodium Carbonate. 2. Estimation of hydrochloric acid using std. Sulphuric acid. 3. Estimation of Borax using std. Sodium carbonate.				
Organic Analysis - I				
Systematic analysis of organic compounds containing one functional group and characterisation by confirmatory tests.				
Books for Study				
1. Advance Practical Chemistry by R. Mukhopadhyay.				
Books for Reference:				
1. Practical Book by Thomas.				

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Perform acid-base titration in volumetric analysis.	K3, K4
CO2	Handle the apparatus used for volumetric and organic analysis.	K3, K4
CO3	Determine the presence of saturation, unsaturation and special elements such as nitrogen, sulphur, halogens in an organic compound	K4, K5
CO4	Carry out the functional group analysis of organic compounds.	K4, K5
CO5	Explore the knowledge of organic reactions such as oxidation and reduction.	K1, K3, K4
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓		✓		
CO2	✓	✓		✓		✓	✓	
CO3	✓	✓		✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓	✓
CO5	✓	✓		✓		✓	✓	✓
Number of matches = 27, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPYAL21/ UBBIAL21	Other Elective Course	ALLIED CHEMISTRY II	5	5
Course Objectives				
To learn concepts of organic, inorganic and physical chemistry.				
Unit-I	Coordination Chemistry and fertilizer			15 Hours
1.1	Nomenclature of coordination compounds – Werner Theory of Coordination Compound – Chelation – Functions and structure of Haemoglobin and Chlorophyll.			
1.2	Fertilizers and manures – Bio-fertilizers – Organic Manures and their importance – Role of NPK in plants – preparation and uses of Urea, Ammonium nitrate, potassium nitrate and super phosphate of lime.			
1.3	Composition of Match sticks and match box – Industrial making of safety matches. Preparation and uses of chloroform, DDT, Gammexane and Freon.			
Unit-II	Biomolecules			15 Hours
2.1	Carbohydrates – Classification – Structure of glucose – Properties and uses of starch – uses of Cellulose Nitrate – Cellulose acetate.			
2.2	Amino Acids – Classification – preparation and properties of Glycine – Classification of Protein - Primary and Secondary structures of protein [Elementary Treatment only] composition of RNA and DNA and their biological role.			
2.3	Substitution reaction – Nitration, halogenation, sulphonation and Friedal - crafts alkylation of benzene.			
Unit-III	Electrochemistry			15 Hours
3.1	Specific and equivalent conductance – their determination – effect of dilution.			
3.2	Kohlrausch's law – Determination of equivalent conductance of weak electrolyte– Conduct metric Titrations - HCl Vs NaOH and CH ₃ COOH Vs NaOH. Electrochemical corrosion and its prevention.			
3.3	p ^H and its determination by indicator method – Buffer solutions – Buffer action – importance of buffer in the living system – Derivation of Henderson equation.			
Unit-IV	Paints, Hormones and Chromatography			15 Hours
4.1	Paints – Pigments – Components of Paint – Requisites of a good paint. Colour and Dyes – Classification based on constitution and application.			
4.2	Biological activities and deficiency, diseases of Vitamin A, B, C, D, E and K – Hormones – Functions of insulin and adrenalin.			
4.3	Chromatography – Principles and application of Column, paper and thin layer chromatography.			
Unit-V	Drugs and Colloidal Chemistry			15 Hours
5.1	Drugs - Sulpha Drugs – Uses and Mode of action of Sulpha Drugs – Antibiotics – Uses of Penicillin, Chloramphenicol, Streptomycin. Drug abuse and their implication.			
5.2	General and Local Anaesthetics – Antiseptics – Example and their application. Definition and one example each for analgesics antipyretics, tranquilizers and sedatives - causes for			

5.3	diabetes, cancer and AIDS. Colloids - Types and classification of colloidal system, Lyophilic and Lyophobic Sols – Dialysis, Electro-dialysis, Ultrafiltration. Emulsion – types – preparation.
Books for Study	
1. Advance Organic Chemistry by Bahl and Arun Bahl. 19th Edition., 2005 - Sulthan and Chand company, New Delhi. 2. Principles of Inorganic Chemistry by B.R. Puri and L.R. Sharma. Shoban Lal Nagin Chand and Co. New Delhi 2000. 3. Principles of Physical Chemistry by B.R. Puri, L.R. Sharma and S. Pathania. Shoban Lal Nagin Chand and Co. New Delhi 2001. 4. “Text book of inorganic Chemistry by P.L. Soni S. Chand & Co., New Delhi 1999.	
Books for Reference:	
1. Advance Organic Chemistry by Bahl and Arun Bahl. 19th Edition., 2005 - Sulthan and Chand company, New Delhi. 2. Principles of Inorganic Chemistry by B.R. Puri and L.R. Sharma. Shoban Lal Nagin Chand and Co. New Delhi 2000. 3. Principles of Physical Chemistry by B.R. Puri, L.R. Sharma and S. Pathania. Shoban Lal Nagin Chand and Co. New Delhi 2001. 4. Text book of inorganic Chemistry by P.L. Soni S. Chand & Co., New Delhi 1999.	

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Explore the industrial applications of paints, matchstick and Fertilizers.	K1, K2, K3
CO2	Classify the various types of sugars and elucidate their structures.	K2, K3
CO3	Apply the knowledge of electrochemistry to corrosion and its prevention.	K3
CO4	Carry out extraction and separation techniques such as chromatography and their types	K4, K5
CO5	Understand the action of drugs such as antibiotics, antiseptics, anesthetics.	K2
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

**MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓	✓			✓
CO2	✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓		✓	✓	✓		
CO5	✓	✓	✓		✓	✓		
Number of matches = 30, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
UBPYAP21 / UBBIAP21	Other Elective Course	ALLIED CHEMISTRY PRACTICAL	3	3
Course Objectives				
To learn the techniques of volumetric titration and analysis organic compound				
Volumetric Titration -II				
1. Estimation of FeSO ₄ using Std. Mohr's Salt Solution. 2. Estimation of Oxalic acid using Std. KMnO ₄ Solution. 3. Estimation of CuSO ₄ using Std. K ₂ Cr ₂ O ₇				
Organic Analysis - II				
Systematic analysis of organic compounds containing one functional group and characterisation by confirmatory tests. Reactions of aldehyde [aromatic], carbohydrate, carboxylic acid [mono], phenol, amide and diamide.				
Books for Study				
1. Advance Practical Chemistry by R. Mukhopadhyay.				
Books for Reference:				
1. Practical Book by Thomas.				

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Determine the amount of substance present in the given solution volumetrically.	K1, K5
CO2	Prepare standard solutions of prescribed normality.	K1, K2
CO3	Utilise the knowledge of functional group analysis such as aldehyde, ketone, phenol and carboxylic acid.	K1, K2
CO4	Determine the presence of saturation, unsaturation and special elements such as nitrogen, sulphur, halogens in an organic compound	K4, K5
CO5	Differentiate the functional groups present in the organic compounds.	K4, K5
KI- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

**MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	✓	✓		✓		✓		
CO2	✓	✓		✓		✓		
CO3	✓	✓		✓	✓	✓		✓
CO4	✓	✓		✓	✓	✓		✓
CO5	✓	✓		✓	✓	✓		✓
Number of matches = 26, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

PROGRAMME OUTCOME FOR M.Sc.

PO1	Demonstrate knowledge and scientific understanding to identify research problems, design experiments, use appropriate methodologies, analyze and interpret data and provide solutions, and Exhibit organizational skills, and the ability to manage time and resources.
PO2	Demonstrate knowledge of the concepts, principles, theories, and techniques of the domain and allied subject areas.
PO3	Synergies knowledge with Analytical & Experimental skills to systematically, create & run programs / carry out experiments / formulate & prove theories to enrich the body of knowledge
PO4	Identify and critically analyze pertinent problems in the relevant discipline using appropriate tools and techniques.
PO5	Exhibit potential to accomplish tasks independently or as a member or leader of a team
PO6	Utilize specialized instruments and Equipment, Computers, Software, Internet, and other ICT tools to carry out experiments
PO7	Create Compounds/Products/Software or Design experiments and/or collaborate to help Society in building a Sustainable Environment
PO8	Discover a passion for Lifelong Learning through MOOCs, ODL, and Self-Learning techniques through optimum use of ICT
PO9	Identify the need and importance of Human Rights, especially for Women, Children, Bonded Laborers, and Refugees.
PO10	Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

[illegible]

PSO6	✓	✓	✓	✓	✓	✓	✓	✓		
PSO7	✓	✓	✓	✓	✓	✓	✓			✓
PSO8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 64, Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

PROGRAMME SPECIFIC OUTCOMES (PSO) On completion of the M.Sc Chemistry Programme, the students will be able to

- PSO1** Orient the skill and knowledge in Computation and its applications in chemistry and handle the suitable software for the subject and correlate it with experimental data.
- PSO2** Apply the multi-dimensional aspects of chemistry and its applications in Material science, Molecular modeling, Drug discovery and Process Development.
- PSO3** Utilize the basic knowledge on structure, reactivity, characterization and applications of chemicals in the development of novel chemical compounds.
- PSO4** Handle the instruments employed in maintaining the quality and control of chemicals in the manufacturing process.
- PSO5** Extract, elucidate the structure and synthesize natural products from the available sources
- PSO6** Apply the knowledge of reactions and mechanism in the synthesis of new chemicals, their analysis and applications.
- PSO7** Carry out any kind of project in the quality control, research and process development in chemical industry, enhancing the job opportunities of the students.
- PSO8** Communicate and work collaboratively with Technologists and Environmentalists leading to sustainable living.

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH1001	Discipline Specific Core Course	INORGANIC CHEMISTRY -I	6	5
Course Objectives				
To make students acquainted with structure and bonding involved in transition metals, metal cluster and boron hydride and basics of crystallography.				
Unit-I	Theories of coordination chemistry			18 Hours
1.1 Crystal field theory (CFT) – d orbital splitting in octahedral, tetrahedral and square planar complexes, Ligand field stabilization energy (LFSE), Spectrochemical series.				
1.2 Spectral and magnetic characteristics of transition metal complexes, Jahn – Teller distortion, Limitations of CFT.				
Unit-II	Coordination chemistry M.O. theory			18 Hours
2.1 Molecular orbital theory – evidence for Metal- Ligand orbital overlap, energy level diagrams; Nephlauxetic effect. Term states of d ions – term symbols, spin orbit coupling (LS coupling or RS coupling), d-d transition				
2.2 Selection rules for transition, Orgel and Tanabe-Sugano diagrams. Charge transfer spectra – features and comparison with d-d spectra.				
Unit-III	Metal clusters & boron hydrides			18 Hours
3.1 Metal clusters: Carbonyl clusters and halide clusters – upto tri-nuclear metal clusters, quadruple bond; naked clusters.				
3.2 Boron hydrides: Polyhedral boranes, carboranes, metallocarboranes – preparation, properties and structure.				
3.3 Structure and bonding in hydrides, di-hydrogen, di-oxygen and tertiary phosphine				
Unit-IV	Solid state			18 Hours
4.1 Structure of solids – Comparison of X-ray and Neutron Diffraction. Structure of Cadmium Iodide, Nickel Arsenide, Rutile, Fluorite & antiferite, Wurtzite structures, Spinel and Inverse Spinel.				
4.2 Defects in solids (Frenkel, Schottky). Non-stoichiometric compounds. Electrical, Magnetic and Optical properties of solids- Band theory of semi-conductors, Organic Semiconductors (basic example),				
4.3 Solid state lasers. Types of magnetic behaviour – dia, para, ferro, antiferro and ferrimagnetism. Hysteresis. Magnetic Susceptibility and measurements – Guoy and Faraday methods.				
Unit-V	Inorganic polymers			18 Hours
5.1 Inorganic polymers: General properties, Phosphorous based polymers – polyphosphazenes; Sulphur based polymers – Sulphur Nitrides – synthesis, structure and applications.				
5.2 Polyacids: Isopolyacids and heteropolyacids of Vanadium, Chromium, Molybdenum and Tungsten – properties and structure				

5.3 Silicates: Types, structure, properties and applications; Molecular sieves. Inorganic phosphors, Ferrites, Garnets.

Books for Study

1. J.E. Huheey, Inorganic Chemistry – Principles, Structure and Reactivity, Harper Collins, New York, IV Edition (1993)
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry – A Comprehensive Text, John Wiley and Sons, V Edition (1988)
3. K.F. Purcell and J.C. Kotz, Inorganic Chemistry – WB Saunders Co., USA (1977)
4. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974)
5. J.E. Huheey, Inorganic Chemistry, Harper Collins NY IV Edition, (1993)
6. G.S. Manku, Inorganic Chemistry (1984)
7. D.F. Shriver, P.W. Atkins and C.H. Langford, Inorganic Chemistry, OUP (1990)

Books for Reference:

1. N.N. Greenwood and Earnshaw, Chemistry of the Elements, Pergamon Press, New York (1984)
2. E.L. Muetterties, Polyhedral Boranes, Academic Press, New York (1975)
3. N.H. Ray, Inorganic Polymers, Academic Press, (1978)
4. S.F.A. Kettle, Coordination Chemistry, EIBS (1973)
5. K. Burger, Coordination Chemistry, Butterworth (1973)
6. F. Basolo and R.G. Pearson, Mechanism of Inorganic Reaction, Wiley NY (1967)
7. R. Sarkar, General and Inorganic chemistry, (Parts I and II), New Book Agency, Calcutta.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Classify & recognize theory of coordination compound including Crystal Field Theory and its limitation.	K2, K3
CO2	Know the basics of Molecular orbital theory of complexes and identify the states and coupling through transition.	K2
CO3	Establish the structures of metal clusters, identify their types and bonding	K5
CO4	Correlates and understand the Solid State of chemistry with their properties associated with electrical, magnetic and optical methods.	K2, K4
CO5	Impart basic and advanced level of knowledge in inorganic polymers including their properties, structure, type and applications.	K1, K2

K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

MAPPING WITH COURSE OUTCOMES (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO 1	✓	✓	✓		✓	✓	✓	
CO 2	✓		✓	✓	✓		✓	
CO 3		✓	✓	✓		✓	✓	
CO 4	✓		✓	✓		✓	✓	✓
CO 5	✓		✓	✓		✓	✓	
Number of matches = 27 , Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH1002	Discipline Specific Core Course	ORGANIC CHEMISTRY - I	6	5
Course Objectives				
To learn the concepts of stereochemistry, and execute conformational analysis and their application in the determination of reaction mechanism. To understand the mechanism of nucleophilic and electrophilic substitution reactions and synthesize simple molecules.				
Unit-I	Stereochemistry			18 Hours
1.1 Optical activity and chirality, Classification of chiral molecules as asymmetric and dissymmetric. A brief Study of dissymmetry of allenes, biphenyls, spirocompounds,ansa compounds, trans cyclooctene and cyclononene, absolute configuration – R, S notation of biphenyls and allenes. Fischer projection. Inter conversion of Sawhorse, Newman and Fischer projections. Molecules with more than one asymmetric center (restricted to five carbons). e.g. Erythro and threo compounds. Asymmetric synthesis. Cram’s rule. Application of this concept to essential amino acids				
1.2 Geometrical isomerism, E, Z - nomenclature of olefins, geometrical isomerism of oximes, Geometrical and optical isomerism (if shown) of disubstituted cyclopropane, cyclobutane and cyclopentane. Stereo specific and stereo selective reactions, Identification of enantiotopic, homotopic, diastereotopic hydrogens and Prochiral compounds in carbon compounds.				
Unit-II	Conformational analysis			18 Hours
2.1 Conformation of some simple 1, 2 – disubstituted ethane derivatives. Conformational analysis of disubstituted cyclohexane. Conformation of substituted cyclohexanol, cyclohexanone and cyclohexane carboxylic acid derivatives.				
2.2 Conformation of fused ring decalins and stereochemistry of cis and trans decalin and 9 – methyldecalin. Graphical representation of energy of conformers with example				
Unit-III	Aliphatic nucleophilic substitution reaction			18 Hours
3.1 S _N 1, S _N 2 and S _N i mechanisms and stereochemistry – Neighbouring group mechanism – reactivity, structural and solvent effects – substitution in norbornyl and bridgehead systems – substitution at carbon doubly bonded to oxygen and nitrogen – alkylation and acylation of amines, halogen exchange, Von-Braun reaction, alkylation and acylation of active methylene carbon compounds, hydrolysis of esters, Wurtz reaction , Williamson reaction, transesterification, Claisen and Dieckmann condensation.				
3.2 Nucleophilic substitution at allylic carbon, allylic rearrangements, S _N 1, S _N 2, S _N i, ambident nucleophile, and ambident substrates				
3.3 S _E 1, S _E 2 and S _E i mechanism, double bond shift – Reactivity. Migration of double bond, keto-enol interconversion, HVZ reaction, Stark-Enamine reaction, halogenation of aldehydes and ketones and decarboxylation of aliphatic acids.				
Unit-IV	Aromatic electrophilic substitution reactions			18 Hours
4.1 The arenium ion mechanism. Orientation and reactivity (ortho, meta and para directing				

groups). Typical reactions – nitration, halogenation, alkylation, acylation and diazonium coupling, Formylation, Reimer – Tieman reaction, Vilsmeier – Haack, Gattermann, Gattermann – Koch, Kolbe reaction. 4.2 Synthesis of di and tri substituted benzene (symmetrical tribromo benzene, 2-amino 5-methylphenol, 3-nitro 4-bromobenzoic acid, 3,4-dibromonitrobenzene, 1,2,3 – trimethylbenzene, 2,4,6, trimethylbenzaldehyde) starting from benzene or any monosubstituted benzene. 4.3 Electrophilic substitution reactions of heterocyclic compounds and Orientation and reactivity.		
Unit-V	Aromatic nucleophilic substitutions & determination of reaction mechanism	18 Hours
5.1 Methods for the generation of benzyne intermediate and reactions of arynes intermediate. Nucleophilic substitution involving diazonium ions. Aromatic Nucleophilic substitution of activated halides. Ziegler alkylation. Chichibabin reaction. Nucleophilic substitution reactions of simple heterocyclic compounds. 5.2 Kinetic and non-kinetic methods of determining organic reaction mechanism. Kinetic isotopic effect – methods of isolation of intermediate and conformation of their structures. Hammett and Taft equations – Simple Problems		
Books for Study 1. Organic Synthesis by R.O.C. Norman, Chapman and Hall, NY, (1980) 2. Physical Organic Chemistry by Niel Isaacs, ELBS Publications (1987) 3. Organic Reaction Mechanism by S.M. Mukherji and S.P. Singh, MacMillan India Ltd., Chennai (1990) 4. Organic Chemistry IV Edition by Stanley Pines 5. Structures and Mechanism by E.S. Gould 6. Advanced Organic Chemistry, Part A and B, by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990), Plenum Press. 7. Aromatic Nucleophilic Substitution by J. Miller 8. Advanced Organic Chemistry III Edition by J. Miller 9. Reactive Molecules, C. Wentrup, John Wiley and Sons, New York (1984) 10. Advanced organic reaction mechanism and structure by J. March, Tata McGraw Hill. 11. Stereochemistry, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai. 12. Stereochemistry of carbon compounds by Ernest Eliel. 13. Heterocyclic chemistry by Joule & Mills – 5th edition.		
Books for Reference: 1. Organic Chemistry, Marc London 2. Organic Chemistry, Mc Murray 3. Organic Chemistry, Graham Solomons 4. Carbenes, Nitrenes and Arynes by T.L. Gilchrist and C.W. Rees, Thomas Nelson and Sons Ltd., London. 5. Stereochemistry and Mechanism through solved problems by P.S. Kalsi. Wiley Eastern Ltd., (1994)		

6. Basic principles of Organic Stereochemistry by P. Ramesh – Madurai Kamaraj University.
7. Organic Reaction Mechanism by R.K. Bansal.
8. A Guide book to mechanism in organic chemistry by Longman.
9. Structure and mechanism in organic chemistry by C.K. Ingold, cornell University press.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Identify and classify the chiral molecules and interconvert their different projections.	K1, K3, K4
CO2	Assign the E & Z nomenclature for olefins and identify prochiral compounds.	K3, K4
CO3	Analyse the different stereo chemical conformations of organic molecules.	K3
CO4	Carry out the substitution reactions in aliphatic and aromatic compounds and synthesis simple starting materials.	K3, K4
CO5	Determine the mechanism of reactions by kinetic and non kinetic methods and solve simple problems in kinetic methods.	K5, K6
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓			✓		
CO2	✓	✓	✓		✓	✓		
CO3	✓	✓	✓	✓	✓			
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 30, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH1003	Discipline Specific Core Course	PHYSICAL CHEMISTRY - I	6	4
Course Objectives				
To learn the chemical potential and its significance. To study the effect of temperature on reaction rate. To study the elements of group theory and the applications of group theory.				
Unit-I	Thermodynamics - I			18 Hours
1.1 Partial molar properties-Partial molar free energy (Chemical potential) – Chemical potential and Gibb’s Duhem equation. Chemical potential of mixture of gases. Partial molar volume, Partial molar enthalpy and partial molar entropy – Significance of partial molar properties. Determination of partial molar Volume, free energy and enthalpy. Variation of chemical potential with temperature and pressure.				
1.2 Concept and definition of fugacity –Methods of determination of fugacity of real gases - variation of fugacity with temperature and pressure – Determination of fugacity in gas mixtures- –Lewis – Randall rule –Derivation of Duhem Margulus equations.				
Unit-II	Thermodynamics-II			18 Hours
2.1 Thermodynamics of real gases- Thermodynamics of ideal and non-ideal binary solutions. Vapour pressure curves of non ideal solution with positive and negative deviations with examples.				
2.2 Excess functions – Excess chemical potential, excess Gibb’s free energy, excess entropy , excess enthalpy and volume. Determination of excess enthalpy and excess volume.				
2.3 The concept of activity and activity coefficients in liquid solutions and its significance– determination of standard free energies – choice of standard states – gases, liquid solvent and solute and dilute solutions. Determination of activity and activity coefficients for non electrolytes by vapour pressure measurements.				
Unit-III	Chemical kinetics			18 Hours
3.1 Effect of temperature on reaction rates – temperature coefficient of reaction rate -collision theory of reaction rate –Test of collision theory – effectiveness of collisions – Steric factor – Weakness of collision theory.				
3.2 Absolute reaction rate theory (ARRT), thermodynamic formulation of reaction rate Eyring equation - Statistical mechanical derivation of reaction rate – ARRT theory to simple unimolecular and bimolecular processes - Significance of enthalpy of activation and entropy of activation.				
3.3 Potential energy surfaces – kinetic isotopic effects - primary and secondary kinetic isotopic effects- Reactions in solutions – effect of dielectric constant and ionic strength on reactions in solutions – derivations - Bjerrum – Bronsted equation – Linear free energy relationships – Hammett and Taft equations.				
Unit-IV	Elements of group theory			18 Hours
4.1 Symmetry elements and symmetry operations – Groups – rules for forming a group, cyclic group, abelian group, sub group, Finite and infinite groups- group multiplication table –				

similarity transformation and classes		
4.2 Identifications of symmetry operations and determination of point groups – Matrix representations - reducible and irreducible representations – Great Orthogonality theorem (GOT) – Rules for constructing the character table–character tables of C_{2v} and C_{3v} point groups.		
Unit-V	Applications of group theory	18 Hours
5.1 Direct product representation and its applications- The standard Reduction formula - hybrid orbitals in non linear molecules (CH_4 , BF_3 , and $PtCl_4$). Determination of representations of vibrational mode analysis in non linear molecules (H_2O , BF_3 , and NH_3).		
5.2 Applications of group theory to infra-red and Raman spectra of water and ammonia molecules– application of group theory to the electronic spectra of ethylene and formaldehyde. Application to determine the Delocalization energy for cyclic π systems.		
Books for Study		
1. S. Glasstone, Thermodynamics For Chemists, Affiliated East West Press, New Delhi, 1950.		
2. J. Rajaram and J. C. Kuriacose, Thermodynamics For Students Of Chemistry, Lal Nagin Chand, New Delhi, 1986.		
3. G. K. Vemulapalli, Physical Chemistry, Prenticall-Hall, 2000.		
4. Thomas Engel and Philp Reid, Physical Chemistry, Pearson Education, 2006.		
5. J.Rajaram and J. C. Kuriacose, Kinetics And Mechanism Of Chemical Transformations. Macmillan India Ltd, 1993.		
6. K. J. Laidler, Chemical Kinetics, Harpet And Row, New York, 1987.		
7. K. L. Kapoor, Atext Book Of Physical Chemistry Macmillan India Ltd, 2001.		
8. V. Ramakrishnan and M. S. Gopinathan, Group Theory In Chemistry, Vishal Publications, 1998.		
9. K. V. Raman, Group Theory and It's Applications To Chemistry, Tata Mcgraw Hill Publishing.Co, 1990.		
10. Bhattacharya: Group Theory And It's Applications.		
11. Veerareddy, Symmetry and Spectroscopy of Molecules. New age Inernational Publishers. 2016		
Books for Reference:		
1. W. J. Moore Chemistry, Orient Longman, London. 1972.		
2. K. G. Denbiegh, Thermodyanamics Of Steady State, Methien And Co. Ltd, London, 1951.		
3. L. K. Nash, Elements Of Chemical Thermodyanamics, Addison Wesley, 1962.		
4. G. M. Barrow, Physical Chemistry, Mcgraw Hill, 1988.		
5. R. G. Frost and Pearson, Kinetics And Mechanism, Wisely, New York, 1961.		
6. C. Capellos and B. H. J. Bielski, Kinetics Systems, Wisely Interscience, New York, 1972.		
7. Amdur and G. G. Hammes, Chemical Kinetics, Principles And Selected Topics, Mcgraw Hill, New York, 1968.		
8. G. M. Harris, Chemical Kinetics, D. C. Health And Co., 1966.		
9. F.A.Cotton, Chemical applications of Group Theory, John Wiley And Sonsinc., New York, 1971.		
10. N.Thinkham, Group Theory and Quantum Mechanics, McGraw Hill Book Company, New		

York, 1964.

11. Strietweiser, Molecular Orbital Theory For Organic Chemists John Wiley And Sons, New York, 1961.
12. D.S.Schonland, Molecular Symmetry, Vannorstrand, London, 1965.
13. Alan Vincent, Molecular Symmetry and Symmetry And Group Theory-Programme Introduction To Chemical Application, Wiley, New York, 1977.
14. Sandony, Electronic Spectra And Quantum Chemistry, Prentice Hall, 1964.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Apply the knowledge by understanding the concept of partial molar properties, fugacity and their determination.	K1, K2
CO2	Illustrate the thermodynamics of real systems, excess functions and the concept of activity parameters determination by computational methods.	K3, K6
CO3	Describe the collision theory, ARRT theories of chemical kinetics, Bjerrum - Bronsted equation and linear free energy relationships.	K3, K5
CO4	Apply the symmetry operations, understand point groups and construct the character tables for molecules.	K1, K2, K4
CO5	Apply group theory to determine the hybrid orbitals and vibrational modes of non-linear molecules and analyze the electronic spectra of ethylene and formaldehyde.	K3, K4
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1			✓	✓	✓	✓		
CO2	✓		✓		✓	✓	✓	✓
CO3		✓		✓	✓	✓	✓	
CO4	✓	✓	✓		✓	✓		
CO5	✓	✓	✓		✓		✓	✓
Number of matches = 26, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHPR11	Discipline Specific Core Pract	ORGANIC CHEMISTRY PRACTICAL - I	6	4
Course Objectives				
To learn the techniques in the preparation of simple organic molecules. To extract a few natural products and analyse organic compounds by spectral and chromatographic methods.				
Any Six preparations from the following				
(i) Preparation of o-benzyl benzoic acid				
(ii) p-Nitrobenzoic acid from p-nitrotoluene				
(iii) Anthraquinone from anthracene				
(iv) Benzhydrol from Benzophenone				
(v) m-Nitroaniline from m-dinitrobenzene				
(vi) 1,2,3,4 – Tetrahydrocarbazole from cyclohexanone				
(vii) p-chlorotoluene form p-toluidine				
(viii) 2,3 – Dimethylindole from phenyl hydrazine and 2 – butanone				
(ix) Methyl orange form sulphanilic acid				
(x) Diphenyl methane from benzyl chloride				
Extraction				
(i) Caffeine from Tea Dust				
(ii) Lactic Acid from Milk				
(iii) Citric Acid from Lemon				
(iv) Jasmine from Rose				
Instrumental Analysis. (Any one of the following)				
(i) Identification of Chromophores using FTIR/ UV Spectroscopy				
(ii) Analysing simple organic substances using Gas Chromatography.				
(iii) Analysing the purity of the prepared organic compounds given in the section-1 using TLC and Column Chromatography.				
Preparation		25 Marks		
Recrystallisation		10 Marks		
Extraction / Inst.Analy		20 Marks		
Practical Viva		10 Marks		
Record		10 Marks		
Total		75 Marks		
Books for Study				
1. Practical Organic Chemistry by Vogel.				
Books for Reference:				
1. Practical Organic Chemistry by Gnanaprakasam.				

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Prepare the organic compounds in a single stage.	K5, K6
CO2	Extract the natural products from common natural sources.	K5, K6
CO3	Identify the groups in an organic molecule by IR and UV - VIS spectrometers.	K3, K4
CO4	Prepare samples for spectral analysis	K3, K4
CO5	Analyse the purity of organic compounds by chromatographic techniques.	K3, K4
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1		✓	✓	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓	✓	✓	✓
CO3		✓	✓	✓	✓	✓	✓	✓
CO4		✓	✓	✓	✓	✓	✓	✓
CO5		✓	✓	✓	✓	✓	✓	✓
Number of matches =35, Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE11	Discipline Specific Elective Course	COLORIMETRY AND KINETIC STUDIES	6	4
Course Objectives				
To learn inorganic complex preparation and colorimetric techniques and to study the experiments in chemical equilibrium and chemical kinetics.				
Preparation of the following:				
(i)	Potassium tris (oxalato) aluminate (III) trihydrate			
(ii)	Tris (thiourea) copper (I) chloride			
(iii)	Potassium tris (oxalato) chromate (III) trihydrate			
(iv)	Sodium bi (thiosulphato) cuprate (I)			
(v)	Tris (thiourea) copper (I) sulphate			
(vi)	Sodium hexanitrocobaltate (II)			
(vii)	Chloropentammine cobalt (III) chloride			
(viii)	Bis (acetylacetonato) copper (II)			
(ix)	Hexammine nickel (II) chloride			
(x)	Bis (thiocyanato) pyridine manganese (II)			
Colourimetric analysis of Iron, Nickel, Manganese and Copper				
(i)	Using 1,10 Phenantharene - Suggestion			
(ii)	Flame Photometry – Suggestion			
Kinetics Studies				
1. Determination of the relative acidity of two different acids by studying the kinetics of hydrolysis of ester in presence of acid.				
2. Determination of the temperature coefficient and Activation energy of hydrolysis of Methyl Acetate.				
3. Determination of the relative strengths of the two given acids by studying the kinetics of inversion of sucrose in presence of acid using Polarimeter.				
4. Study of the kinetics of persulphate oxidation.				
5. Study of the kinetics of Iodination of Acetone.				
6. Freundlich Adsorption isotherm of adsorption of oxalic acid on charcoal				
		Practical	55 Marks	
		Viva-Voce	10 Marks	
		Record	10 Marks	
		Total	75 Marks	
Books for Study				
1. Qualitative Inorganic Analysis by V.V. Ramanujam				
2. Practical Inorganic Chemistry by Vogel.				
3. Physical Practical Experiments by Palit.				

- By the end of the course, the students will be able to

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1		✓	✓			✓	✓	✓
CO2	✓			✓	✓		✓	
CO3	✓			✓	✓	✓	✓	✓
CO4		✓	✓	✓		✓	✓	✓
CO5	✓		✓	✓	✓	✓	✓	

Number of matches = 27, Correlation: High

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE12	Discipline Specific Elective Course	METAL ION ESTIMATION AND COMPLEX PREPARATION AND KINETIC STUDIES	6	4
Course Objectives				
To learn the methods of estimation of metal ions and the preparation coordination complexes of metal ions with mono and polydentate ligands. To determine and study the variation of physical parameters under different experimental conditions for chemical reactions which are in equilibrium and time dependent.				
Preparation of the following:				
(a) Bis (thiocyanato) pyridine manganese (II) (b) Tris (thiourea) copper (I) chloride (c) Sodium hexanitrocobaltate (II) (d) Potassium tris (oxalato) aluminate (III) trihydrate (e) Chloropentammine cobalt (III) chloride (f) Tris (thiourea) copper (I) sulphate (g) Bis (acetylacetonato) copper (II) (h) Sodium bi (thiosulphato) cuprate (I) (i) Hexammine nickel (II) chloride (j) Potassium tris (oxalato) chromate (III) trihydrate				
Colourimetric analysis of Manganese, Iron, Copper and Nickel				
a) Using 1,10 Phenanthrene - Suggestion b) Flame Photometry – Suggestion				
Kinetics Studies				
1. Freundlich Adsorption isotherm of adsorption of oxalic acid on charcoal. 2. Study of the kinetics of Iodination of Acetone. 3. Determination of the relative strengths of the two given acids by studying the kinetics of inversion of sucrose in presence of acid using Polarimeter. 4. Study of the kinetics of persulphate oxidation. 5. Determination of the relative acidity of two different acids by studying the kinetics of hydrolysis of ester in presence of acid.				

6. Determination of the temperature coefficient and Activation energy of hydrolysis of Methyl Acetate.		
	Practical	55 Marks
	Viva-Voce	10 Marks
	Record	10 Marks
	Total	75 Marks
Books for Study		
1. Qualitative Inorganic Analysis by V.V. Ramanujam 2. Practical Inorganic Chemistry by Vogel. 3. Physical Practical Experiments by Palit. 4. Advance Practical Chemistry by R. Mukhopadhyay & P. Chatterjee. 5. Advanced Practical Physical Chemistry by J.B Yadav 6. Practical Physical Chemistry by B. Viswanathan & P.S. Raghavan		
Books for Reference:		
1. Qualitative Inorganic Analysis by V.V. Ramanujam 2. Practical Inorganic Chemistry by Vogel. 3. Physical Practical Experiments by Palit. 4. Advance Practical Chemistry by R. Mukhopadhyay & P. Chatterjee. 5. Advanced Practical Physical Chemistry by J.B Yadav Practical Physical Chemistry by B. Viswanathan & P.S. Raghavan		

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Prepare various Inorganic complexes and recrystallise them.	K5, K6
CO2	Estimate various metal ions by colorimetric methods.	K4, K5
CO3	Carry out the alternate methods of metal ion estimations.	K4, K5
CO4	Determines thermodynamic and kinetic parameters by experiments.	K3, K4
CO5	Follow the inversion of configuration of biomolecules by polarimeter.	K5
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1		✓	✓	✓		✓	✓	✓
CO2	✓	✓	✓	✓		✓	✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓	✓
CO5		✓	✓	✓	✓	✓	✓	✓
Number of matches = 34, Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE13	Discipline Specific Elective Course	APPLIED CATALYSIS	6	4
Course Objectives				
To understand various theories of reaction rate and concept of acid base catalysis. To make students acquainted with different types of catalysis and its applications. To explain the mathematical concepts and derive equations for catalysis and the mechanism of catalysis.				
Unit-I	Theories of reaction rates			18 Hours
1.1 Collision theory of reaction rate – molecular beams – collision cross sections – effectiveness of collisions – Steric factor – Limitations of collision theory.				
1.2 Absolute reaction rate theory (ARRT), activated complex to simple unimolecular and bimolecular processes. Eyring equation Comparison of ARRT theory and collision theory. Significance of enthalpy of activation and entropy of activation.				
1.3 Theories of unimolecular reactions – Perrins theory – Lindemann theory – Formulation of Lindemanns theory – criticism on Lindemann theory – Hinshelwoods theory – Slater treatment.				
Unit-II	Homogeneous catalysis			18 Hours
2.1 Theory of Homogeneous catalysis – Function of catalyst in terms of Gibbs Free Energy of activation .Concepts of acidity – Bronsted – Lewis acids. Concept of base – Brosted – Lewis bases.				
2.2 Acid – Base catalysis. Types of Acid – Base catalysis – Kinetics of Acid – Base catalysis – Effect of pH on reaction rate – Catalytic coefficient - Hamett and Bronsted Equation – Acidity Function – Advantage and disadvantages of homogeneous catalysts.				
Unit-III	Heterogeneous catalysis			18 Hours
3.1 Theory of Heterogeneous catalysis – Quantitative treatment of adsorption – Kinetics of Heterogeneous reactions – influence of pressure on reaction rate – Retarded reactions.				
3.2 Effect of temperature on Heterogeneous reactions -Absolute rate theory in Heterogeneous gas reactions - Metal and metal oxide catalyst – Metal oxide supported catalyst, polymer supported catalyst. Solid acid and base catalyst				
Unit-IV	Photo catalysis			18 Hours
4.1 Light absorption- laws of photochemistry- quantum yield – Standardization of light sources – Determination of quantum yield – Actinometry – chemical actinometry				
4.2 Photo sensitization – Photo electro chemical cell – Photo isomerization - Photo assisted electrolysis of water - photo chemical applications - Environmental Pollution control and dye degradation using photo catalysis				
Unit-V	Enzyme catalysis			18 Hours
5.1 Enzyme catalysis – Enzymatic reactions of biological importance - Advantages of enzyme catalysis - Reaction specificity – Theory of Enzyme catalysis – Lock and key theory -				

Coenzyme - Factors influencing enzyme action – temperature, pH, Enzyme activators – enzyme inhibitors - enzyme concentration and substrate concentration.

5.2 Mechanism of enzyme catalysis - Michaelis – Menton Equation – V_{max} and half V_{max} – turnover number - and Lineweaver – Burk method– Eadie –Hofstee method.

Books for Study

1. K.J. Laidler, Chemical Kinetics, 3rd edn., Harper and Row publisher, New York, 1987.
2. B. Viswanathan, Catalysis: Principles and application, Narosa Publ., New Delhi 2004.
3. V. Ramamurthy, Photochemistry in organized and constrained media, VCH Edn. New York, 1991.
4. Roshatghi Mukherjee Fundamentals of Photo chemistry

Books for Reference:

1. V. Murugesan, Recent trends in catalysis, Narosa Publ., New Delhi, 2004.
2. K. Kalyanasundara, Photochemistry in microheterogeneous systems, Academic Press, New York, 1987.
3. Samuel H. Maron, Principles of Physical Chemistry, Mac Millan, Publ., New York 1972.
4. E. Conn and K. Stump, Outlines of Biochemistry, John Wiley and Sons, 1987.
5. Friedlich Liebau, Structural Chemistry of Silicates, Springer – Verlag, Berlin, 1985.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Analyse the theories of reaction kinetics and their significance.	K3, K4
CO2	Illustrate the concept free energy of activation and theories of homogenous catalysis.	K3, K4
CO3	Describe the theories and kinetics of heterogeneous catalysis.	K3, K4
CO4	Explain the laws of photochemistry, actinometry and photochemical applications.	K4
CO5	Carry out enzyme catalysis and propose mechanisms for catalyzed reactions.	K5
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

**MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓			✓	✓
CO2	✓	✓	✓	✓			✓	✓
CO3	✓	✓	✓	✓			✓	✓
CO4	✓	✓	✓	✓			✓	✓
CO5	✓	✓	✓	✓		✓	✓	✓
Number of matches = 31, Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH2001	Discipline Specific Core Course	INORGANIC CHEMISTRY - II	5	5
Course Objectives				
To make the students acquaint themselves with coordination compounds, nuclear Chemistry know-how, Stellar and cosmic phenomena.				
Unit-I	Coordination chemistry			18 Hours
1.1 Stability of complexes – factors affecting the stability of complexes, thermodynamic aspects of complex formation, determination of stability constants – spectrophotometric, polarographic and potentiometric methods.				
1.2 SHAB approach – Pearson`s principle - Classification of Acids and Bases as Hard or Soft, Acid- Base Strength and Hardness and Softness, Symbiosis, Theoretical Basis of Hardness and Softness, Applications in metallurgy				
Unit-II	Stereochemistry of coordination compounds			18 Hours
2.1 Stereochemical aspects– Stereoisomerism in inorganic complexes, isomerism arising out of ligand conformation and absolute configuration of the complex, chirality and the nomenclature of the chiral complexes				
2.2 Optical rotatory dispersion (ORD) and Circular Dichroism (CD), Cotton Effect, Absolute Configuration of metal complexes. Macrocyclic ligands – Crown ethers, Porphyrins, Corrins, Cryptands and Schiff`s bases				
Unit-III	Coordination chemistry reaction mechanism			18 Hours
3.1 Electron transfer reactions – outer and inner sphere mechanisms, atom transfer reactions, precursor and successor complexes, Marcus theory, bridging ligands, complementary and non-complementary electron transfer reactions.				
3.2 Substitution reactions in square planar complexes –mechanism of substitution, Trans effect, Cis effect, effect of Entering and Leaving ligands and the effect of metal ions on the rate of Substitution, theory and applications of Trans effect.				
Unit-IV	Nuclear chemistry – i			18 Hours
4.1 Nuclear properties – Nuclear spin and Moments, origin of nuclear forces, Quark Theory for sub-atomic particles. Salient features of the Liquid Drop and Shell models of the nucleus.				
4.2 Modes of radioactive decay: Orbital electron capture; nuclear isomerism, internal conversion Isomeric Transition, detection and determination of activity by cloud chamber, Nuclear emulsion, Bubble chamber, G.M. counter Scintillation and Cherenkov counters.				
4.3 Compound Nucleus theory, high energy nuclear reactions, nuclear fission and fusion reactions as energy sources: direct reactions:				
Unit-V	Nuclear chemistry – ii			18 Hours
5.1 Nuclear Reaction types, reaction, cross section, Q-value, threshold energy, Stellar energy: synthesis of elements, Hydrogen burning, Carbon burning. Photonuclear and Thermo nuclear reactions. Szilard Chalmers reaction. The e, s, r, p and x processes.				
5.2 Nuclear reactors: fast breeder reactors, particle accelerators, cyclotron and synchrotron.				

5.3 Radio analytical methods: Isotope dilution analysis, Radiometric titrations, Radio immuno assay, and Neutron activation analysis.

Books for Study

1. J.E. Huheey, Inorganic Chemistry – Principles, Structure and Reactivity, Harper Collins, New York, IV Edition (1993)
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry – A Comprehensive Text, John Wiley and Sons, V Edition (1988)
3. K.F. Purcell and J.C. Kotz, Inorganic Chemistry – WB Saunders Co., USA (1977)
4. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974)
5. J.E. Huheey, Inorganic Chemistry, Harper Collins NY IV Edition, (1993)
6. G.S. Manku, Inorganic Chemistry (1984)
7. D.F. Shriver, P.W. Atkins and C.H. Langford, Inorganic Chemistry, OUP (1990)
8. N.N. Greenwood and Earnshaw, Chemistry of the Elements, Pergamon Press, New York (1984)
9. E.L. Muetterties, Polyhedral Boranes, Academic Press, New York (1975)
10. N.H. Ray, Inorganic Polymers, Academic Press, (1978)
11. S.F.A. Kettle, Coordination Chemistry, EIBS (1973)

Books for Reference:

1. K. Burger, Coordination Chemistry, Butterworth (1973)
2. F. Basolo and R.G. Pearson, Mechanism of Inorganic Reaction, Wiley NY (1967)
3. R. Sarkar, General and Inorganic chemistry, (Parts I and II), New Book Agency, Calcutta.
4. H.J. Arnika, Nuclear Chemistry, Wiley Eastern Co., II Edition, 1987.
5. S. Glasstone, Source Book on Atomic Energy, Van Nostrand Co., 1969
6. G. Frieslander, J.W. Kennedy and J.M. Miller, Nuclear and Radiochemistry, John Wiley and Sons, 1964.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Discuss the various factors affecting the stability of complexes spectrometric / polarographic and potentiometric methods and classify the acids and bases of hardness.	K3, K4
CO2	Identify the stereochemical aspects of inorganic materials and characterize crown ethers, porphyrins and Schiff's bases etc.	K2, K3
CO3	Write the different types of mechanism of electron transfer reaction and explain the factors affecting them.	K3
CO4	Identify and define various types of nuclear changes, processes including fission, fusion and decay reactions.	K3, K4

CO5	Compare the different types of nuclear reactions and the various types of process in nuclear chemistry and their applications.	K5
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1			✓	✓		✓	✓	✓
CO2	✓		✓	✓		✓	✓	✓
CO3	✓		✓	✓		✓	✓	✓
CO4		✓	✓	✓	✓	✓	✓	✓
CO5		✓	✓	✓	✓	✓	✓	✓
Number of matches = 31 , Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH2002	Discipline Specific Core Course	ORGANIC CHEMISTRY - II	6	5
Course Objectives				
To learn the various types of reactions, rearrangements and their synthetic utility.				
Unit-I	Addition to carbon – carbon and carbon –hetero multiple bonds			18 Hours
1.1 Electrophilic, nucleophilic, and Free radical addition mechanisms – addition of halogen and nitrosyl chloride to olefins. Hydration of olefins and alkynes, hydroxylations, Hydroboration, Diels-Alder reaction.				
1.2 Aldol condensation, knovenagal condensation, Ene synthesis, Michael addition, 1, 3 – dipolar additions – Simmon and Simmon Smith reaction. Mannich reaction, Stobbe condensation, Darzen,perkin, Wittig, Reformatskyand Benzoin reactions. Stereochemical aspects to be studied wherever applicable.				
Unit-II	Elimination reactions			18 Hours
2.1 E ₁ , E ₂ and E ₁ CB mechanism – E ₁ , E ₂ and E ₁ CB spectrum –comparison between E ₁ ,E ₂ and E ₁ cb reactions, Pyrolytic, E _i - elimination, Orientation of the double bond – Hoffman and Saytzeff rules – Competition between elimination and substitution.				
2.2 Typical eliminations reactions. Dehydration of alcohols, dehydrohalogenation and dehalogenation, Peterson elimination. Stereochemistry of E ₂ eliminations in cyclohexane systems. Mechanism of pyrolytic eliminations. Chugaev and Cope eliminations.				
Unit-III	Molecular rearrangements			18 Hours
3.1 A detailed study with suitable examples of the mechanism of the following rearrangements: Pinacol – Pinacolone – Wittig - Wagner – Meerwein, Tiffenve - Demjanov, dienone – phenol rearrangement,				
3.2 Favorski, Baeyer – Villiger, Wolf, Stevens (in cyclic systems) and Von Richter rearrangements. Lossen, Curtius, Hoffmann, Beckmann, Sommet Hauser, Claisen and Ortho claisen rearrangements.				
Unit-IV	Oxidation			18 Hours
4.1 Mechanism – study of the following oxidation reactions – oxidation of alcohols – use of DMSO in combination with DCC or acetic anhydride in oxidising alcohols – oxidation of methylene to carbonyl, oxidation of aryl methanes – allylic oxidation of olefins.				
4.2 Formation of C=C, C-C bonds by dehydrogenation, dehydrogenation by quinones , oxidations with SeO ₂ , Hg(OAc) ₂ and Pb(OAc) ₄ , DESS - MARTIN reagents . Formation of C-C bond in phenol coupling – acetylene coupling-allylic oxidation - oxidation of alcohol, glycols, halides and amines to aldehydes and ketones - Ozonolysis-oxidation of Olefinic double bonds and unsaturated carbonyl compounds, Epoxidation - enantioselective hydroxylation of olefenes - oxidative cleavage of C-C bond.				
Unit-V	Reduction, carbenes and nitrenes			18 Hours

- 5.1 Reduction: Enantioselective hydrogenation of olefenes. Selectivity in reduction 4-t-butylcyclohexanone using selective hydride reducing agents - Selectrides – Synthetic importance of Clemmenson and Wolf-Kishner reductions – Modification of Wolff-Kishner reduction
- 5.2 Birch reduction, MPV reduction. Catalytic hydrogenation, Sommelet reaction. Reduction with LiAlH_4 , NaBH_4 , tritertiarybutoxyaluminium hydride, sodium Cyanoborohydride, trialkyltinhydride, Hydrogen transfer from diimides and hydrazines. Carbenes and nitrenes : Methods of generation , structure, addition reactions with alkenes – insertion reactions.

Books for Study

1. Principles of organic synthesis R.O.C. Norman, Chapman and Hall, London. 1980.
2. Structure and Mechanism by E.S. Gould
3. Advanced Organic Chemistry – Part B by Francis A. Carey and Richard J, Sundberg, 3rd Edition 1990.
4. Organic Reaction Mechanism by S.M. Mukherji and S.P. Singh, MacMillan India Ltd., Chennai – 1990.
5. Organic synthesis by Michael Smith.
6. Carbenes, Nitrenes and Arynes by T.L. Gilchrist and C.W. Rees, Thomas Nelson and Sons Ltd., London.
7. Molecular Rearrangements Vol-I and Vol-II by Paul de Mayo.
8. Advanced Organic Chemistry III Edition by J. March.

Books for Reference:

1. Stereochemistry and Mechanism through solved problems by P.S. Kalsi, Wiley Eastern Ltd., 1994.
2. Some Modern Methods of Organic Synthesis by W Carruthers, III Edition, Cambridge University Press, 1993.
3. Modern Synthetic Reactions by H.O. House, The Benjamin Cummings Publishing Company, London, 1972
4. Advanced organic chemistry, Mc Murray, Thomas Pvt. Ltd.,
5. Organic reaction mechanisms: Parmer and Chawla, S. Chand and Co.,

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Carry out the electrophilic and nucleophilic addition over multiple bonded organic molecules.	K3, K4
CO2	Carry out the various name reactions and rearrangement reactions and synthesis simple molecules in synthetic organic chemistry.	K3, K4
CO3	Execute the elimination reactions and establish the stereochemistry of products.	K4, K5
CO4	Interconvert organic molecules by oxidation and reduction	K5

	reactions and Establish and propose the mechanism of organic reactions.	
CO5	Utilize carbenes and nitrenes in synthetic organic reactions.	K2, K3
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓			✓		✓
CO2	✓	✓	✓		✓	✓	✓	
CO3	✓	✓	✓	✓		✓	✓	
CO4			✓		✓	✓		
CO5	✓		✓	✓		✓	✓	✓
Number of matches = 26, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCH2003	Discipline Specific Core Course	PHYSICAL CHEMISTRY- II	6	4
Course Objectives				
To study the different types of molecular spectroscopy, and kinetics of complex reactions. To study the fundamental principles of Quantum Chemistry, Schrodinger wave equation and its applications.				
Unit-I	Spectroscopy - I			18 Hours
1.1 Electromagnetic radiation – regions of EMR and spectroscopy – Rotational Spectroscopy – Classification of molecules - Diatomic molecules as rigid rotator – Energy level and selection rule - Diatomic non rigid rotator- Energy levels – selection rule – Problems in rotational spectroscopy - Rotational spectroscopy of polyatomic molecules				
1.2 Vibrational spectroscopy – Molecular vibrations – Simple harmonic oscillator - Anharmonic Oscillator - vibrational spectra of poly atomic molecules – vibrational frequencies – group frequencies – overtones – Combinational bands – difference bands – Fermi resonance.				
1.3 Raman Spectra- elastic and inelastic scattering – pure rotational Raman spectra – Rule of Mutual exclusion.				
Unit-II	Surface Chemistry			18 Hours
2.1 Adsorption - Types of Adsorption – Physisorption and chemisorption – Factors affecting adsorption – Adsorption isotherms – Heat of adsorption - Applications of Adsorption				
2.2 Freundlich Adsorption isotherm – Langmuir Adsorption Isotherms – limitations of Langmuirs theory - BET adsorption isotherms - Derivation of BET Equation - surface area determinations.				
2.3 Study of kinetics of surface reactions - unimolecular and bimolecular - Adsorption theory of Heterogeneous catalysis - mechanism of heterogeneous catalytic reactions-the adsorption coefficient and its significance.				
Unit-III	Chemical Kinetics			18 Hours
3.1 Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions - Linear chain and branching chain reaction-chain length - Rice Herzfeld mechanism for the decomposition of acetaldehyde - Rate expressions and scheme of reactions following half order, first order and one and half order explosion limits. Upper and lower explosion limits.				
3.2 Study of fast reactions - relaxation methods-temperature and pressure jump methods - stopped flow and flash photolysis method.				
Unit-IV	Introduction to quantum chemistry			18 Hours
4.1 Planck’s quantum theory – photoelectric effect and Bohr’s theory of hydrogen atom in the view of Quantum theory - Compton effect - wave particle duality - de-Broglie hypothesis - Electron waves and diffraction. Heisenberg’s uncertainty principle – quantum mechanical				

postulates - Wave function (Ψ) and significance of Ψ and Ψ^2 – Linear, commutator, Angular momentum, Laplacian, Hamiltonian and Hermitian operators– Eigen values and Eigen functions – orthogonality and normalization - Hermitian properties.

4.2 Schrodinger equation - applications of Schrodinger's equation to a simple system, Translational motion of a particle in one, two and three dimensional box cases.

Unit-V	Applications of quantum chemistry	18 Hours
5.1	The harmonic oscillator-the rigid rotor-particle in a ring, Schrodinger equations for hydrogen (no derivation is required) and Hydrogen like atoms (He^+ and Li^{2+}) and their solutions.	
5.2	The origin of quantum numbers (angular momentum and spin) - their physical significance - radial and angular probability distribution functions. Shape and size of orbitals.	

Books for Study

1. C.N.Banwell and E.McCash, Fundamentals of Molecular spectroscopy IV Edition, Tata McGraw Hill, 2005.
2. D.N.Sathyanarayana, Vibrational Spectroscopy, New Age International publishers, 2004.
3. J.Rajaram and J.C.Kuriacose, Kinetics and Mechanism Of Chemical Transformations. Macmillan India Ltd, 1993.
4. R.J.Laidler, Chemical Kinetics, Harpet And Row, New York, 1987.
5. D.A. Mcquarrie, Quantum Chemistry, University Science Books, Mil Valley, California, 1983.
6. Quantum Chemistry, Allyn And Bacon, Boston, 1983.
7. R. Anantharaman, Fundamentals Of Quantum Chemistry, Mamillan India Limited, 2001.

Books for Reference:

1. Raymond Chang, Basic Principles Of Spectroscopy, Mcgraw Hill Ltd., New York, 1971.
2. P.W. Atkins, Advanced Physical Chemistry, Oxford Press, 1990.
3. G. ArulDoss, Molecular Structure and Spectroscopy, Prentice Hall, 2002.
4. R.G. Frost and Pearson, Kinetics And Mechanism, Wiley, New York, 1961.
5. W.J. Moore and R.G. Pearson, Kinetics And Mechanism, 1981.
6. C. Capellos and B.J.J. Bielski, Kinetics Systems, Wisely Inter Science, New York, 1972.
7. Ambur and G.G. Hammes, Chemical Kinetics, Principles And Selected Topics, Mcgraw Hill, New York, 1968.
8. G.M. Harris, Chemical Kinetics, D.C. Heat And Co., 1966.
9. R.K. Prasad, Quantum Chemistry, University Science Books, Mil Valley, California, 1983.
10. J. Goodisman, Contemporary Quantum Chemistry, An Introduction, Plenum Press, New York, 1997.
11. R. Mcweeny, Coulon's Valence, Elbs Oxford University Press, 1979.
12. F.J. Bockhoff, Elements Of Quantum Theory, Addison Wesley, Reading Mass, 1976.
13. P.W. Atkins, Physical Chemistry, Oxford University Press, 1990.
14. H. Eyring, J. Walter and G. Gimball Quantum Chemistry, John Wiley And Sons, New York, 1944.
15. Linus Pauling and Wilson Introduction To Quantum Mechanics, Mcgraw Hill Book Company, New York, 1935.
16. P.W. Atkins, Molecular Quantum Mechanics, Oxford University Press, Oxford, 1983.
17. Principles of Quantum Chemistry, by R.K. Prasad.

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHPR21	Discipline Specific Core Pract.	PHYSICAL CHEMISTRY PRACTICAL	5	4
Course Objectives				
To make the students expertise in the experiments related to phase equilibrium.				
Unit-I				__ Hours
1. Phase diagram for a simple binary system of Naphthalene – Biphenyl or Benzophenone - Diphenyl amine. 2. Determination of partition coefficient of succinic acid between ether and water. 3. Determination of Association factor and distribution coefficient of benzoic acid in benzene - water. 4. Determination of equilibrium constant of the reaction between iodine and potassium iodide by partition method and determine the concentration of the given unknown KI solution 5. Determination of K_f value of the given solvent and molecular weight of the given solute by Rast method. 6. Determination of viscosity coefficient of a liquid by Digital viscometer (Demonstration only).				
Practical		55 Marks		
Viva-Voce		10 Marks		
Record		10 Marks		
Total		75 Marks		
Books for Study				
1. Physical Practical Experiments by Palit 2. Advance Practical Chemistry by R. Mukhopadhyay& P. Chatterjee.				
Books for Reference:				
1. Practical Physical Chemistry by Findler and Findler - Advanced Practical Physical Chemistry by J.B Yadav				

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE21	Discipline Specific Elective Course	ANALYSIS OF ORGANIC AND INORGANIC MIXTURE	6	4
Course Objectives				
1. To learn the separation of inorganic radicals & identify them.				
2. To learn the separation and identification of components in a two component organic mixture, and preparation of their derivatives.				
3. To determine b.pt. / m.pt. for components and m.pt. for the derivatives.				
INORGANIC				
a) Semimicro qualitative analysis of mixture containing two common and two rare cations.				
b) The following are the rare cations to be included. W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo.				
c) Estimation of hardness of water using EDTA.				
ORGANIC				
a) Identification of components in a two component mixture and analysis of the individual compounds				
b) Preparation of their derivatives in solid form.				
c) Determination of b.p. / m.p. for components and m.p. for the derivatives.				
Experiment		55 Marks		
Practical Viva		10 Marks		
Record		10 Marks		
Total		75Marks		
Books for Study				
1. Qualitative Inorganic Analysis by V.V. Ramanujam				
2. Practical Inorganic Chemistry by Vogel.				
3. Practical Organic Chemistry by Vogel.				
4. Practical Organic Chemistry by Gnanaprakasam.				
Books for Reference:				
1. Qualitative Inorganic Analysis by V.V. Ramanujam				
2. Practical Inorganic Chemistry by Vogel.				
3. Practical Organic Chemistry by Vogel.				

4. Practical Organic Chemistry by Gnanaprakasam.

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Separate the metal ions in a mixture and analyse it systematically.	K1, K2
CO2	Identify and confirm the metal ions in a inorganic mixture.	K3, K6
CO3	Develop simple methods of separation of organic compounds.	K4, K6
CO4	Analyse the organic compounds and determine the characteristic nature of organic compound.	K3, K4
CO5	Prepare suitable derivatives for the organic compounds and determine their boiling point / melting point.	K4, K6
K1- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1			✓	✓	✓	✓	✓	✓
CO2			✓	✓	✓	✓	✓	✓
CO3			✓	✓	✓	✓	✓	
CO4				✓		✓	✓	
CO5	✓		✓	✓	✓	✓	✓	
Number of matches = 26, Correlation: High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE22	Discipline Specific Elective Course	SEMI MICRO INORGANIC AND ORGANIC QUALITATIVE ANALYSIS	6	4
Course Objectives				
1. To learn the separation of inorganic compounds and identify them in terms of their components.				
2. To carryout semi micro analysis for the identification of inorganic compounds				
3. To learn the separation and identification of organic compounds by following standard procedure of semi micro analysis.				
4. To determine b.pt. / m.pt. for components and m.pt. for the derivatives.				
INORGANIC				
a) Inorganic qualitative analysis of salt mixture containing common and rare cations.				
b) The common rare cations are W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo.				
ORGANIC				
a) Identification of components in a organic mixture and analysis of the individual and preparation of their derivatives.				
b) Determination of b.p. / m.p. for identified components and its derivatives				
		Total	75Marks	
		Experiment	55 Marks	
		Practical Viva	10 Marks	
		Record	10 Marks	
Books for Study				
1. Qualitative Inorganic Analysis by V.V. Ramanujam				
2. Practical Inorganic Chemistry by Vogel.				
3. Practical Organic Chemistry by Vogel.				
4. Practical Organic Chemistry by Gnanaprakasam.				
Books for Reference:				
1. Qualitative Inorganic Analysis by V.V. Ramanujam				
2. Practical Inorganic Chemistry by Vogel.				
3. Practical Organic Chemistry by Vogel.				
4. Practical Organic Chemistry by Gnanaprakasam.				

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
PBCHDE23	DSE	MEDICINAL CHEMISTRY	6	4
Course Objectives				
To design and classify the drugs by their mode of action. To synthesis drugs and establish the properties, structure activity relationship, mode of action etc,				
Unit-I	Basic concepts of medicinal chemistry			18 Hours
1.1 Drug design – analogues and pro-drugs, factors governing drug design, rational approach, method of variation and tailoring of drugs; physical properties – factors governing drug action at active site, factors governing ability of drugs to reach active site, dissociation constants, isosterism and bioisosterism.				
1.2 General anaesthetics – inhalation anaesthetics, intravenous anaesthetics and basal anesthetics; mode of action; local anaesthetics – classification and synthesis, sedatives and hypnotics – classification, synthesis, mode of action and structure – activity relationship.				
Unit-II	Anticonvulsants, stimulants and antipyretic analgesics			18 Hours
2.1 Anticonvulsants – Classification, synthesis and mode of action; Muscle relaxants – classification, synthesis and mode of action.				
2.2 Central nervous system stimulant – Classification, synthesis and mode of action; Antipyretic analgesics – classification, synthesis and mode of action.				
Unit-III	Other analgesics			18 Hours
3.1 Narcotic or Opiate analgesics – classification, preparation and mode of action; Narcotic antagonists; Cardiovascular drug – classification, synthesis and mode of action.				
3.2 Autonomic drugs – synthesis and mode of action of sympathomimetic drugs, antiadrenergic drugs, cholinomimetic drugs, antimuscarinic drugs, ganglionic blocking agents and adrenergic neurone blocking agents; Diuretics – synthesis and mode of action of mercurial and non-mercurial diuretics.				
Unit-IV	Antihistamines, anti-inflammatory and antiparkinson drug			18 Hours
4.1 Antihistaminics – synthesis and mode of action of histamine H ₁ receptor antagonists and histamine H ₂ -receptor blockers; prevention of histamine release; structure-activity relationships amongst H ₁ -receptor blockers.				
4.2 Non-steroidal anti-inflammatory drugs (NSAID) – synthesis and mode of action of heteroarylacetic acid analogues, arylacetic acid analogues, arylpropionic acid analogues, naphthalene acetic acid analogues, gold compounds, salicylic acid analogues and				

pyrazolones and pyrazolodiones; Antiparkinsonism agents – synthesis and mode of action of piperidine analogues, pyrrolidine analogues and phenothiazine analogues.		
Unit-V	Other drugs	18 Hours
5.1 Expectorants and anti tissusives – synthesis and mode of action of sedative expectorants, stimulant expectorants and centrally acting antitussive agents. Sulphonamides – Preparation and mode of action of sulphonamides for general, urinary, intestinal and local infection; sulphonamide inhibition.		
5.2 Antimalarials – synthesis and mode of action of aminoquinoline analogues, aminoacridine analogues, guanidine analogues, pyrimidine analogues, sulfone and quinine analogues; Steroids – synthesis and mode of action of sterols, sex hormones, cardiac glycosides, bile acids and sapogenins. Antibiotics – synthesis of mode of action of penicillins, aminoglycoside antibiotics, chloramphenicol and tetracyclines.		
Books for Study		
1. AshutoshKar, Medicinal Chemistry, New age International, 1996.		
2. W.O. Foye, Principles of medicinal chemistry, 2 nd Edn. Lea &Febiger, Philadelphia, 1981.		
Books for Reference:		
1. M.E. Wolff, Burger's Medicinal Chemistry, 4 th Edn., John Wiley & Sons, New York, 1981.		
2. F.F. Blicke and R.H. Cox, Medicinal Chemistry, John Wiley & Sons, New York, 1959.		
3. D. Lednicer and L.A. Mitscher, Organic Chemistry of drug synthesis, John Wiley & Sons, New York, 1959.		
4. J.E. Hoover, Remington's Pharmaceutical Sciences, 15 th Edn. Mack Publ. Company, Easton. 1975.		

By the end of the course, the students will be able to

COs	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Design drugs by learning various methods of computer assisted methods.	K5, K6
CO2	Classify the various drugs by their properties and mode of action in medical treatment.	K4, K5
CO3	Synthesize various drugs by their requirement in medical field.	K5, K6
CO4	Develop their ability to work in pharmaceutical industries.	K5, K6
CO5	Develop throughput methods for the production of new powerful drugs.	K5, K6
KI- Remembering/Knowledge, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create		

MAPPING COURSE OUTCOMES (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (Cos)	Program Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓		✓	✓	✓
CO2	✓	✓	✓	✓		✓	✓	✓
CO3	✓	✓	✓	✓			✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 36, Correlation: Very High								

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

**DEPARTMENT OF
BIOCHEMISTRY
UG & PG SYLLABI**

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBBI1001	Discipline Specific Core Course	Cytology	3	3
Course Objectives: 1. To acquire basic knowledge about various types of cells. 2. To familiarize cellular architecture and organization. 3. To know the functions of various cell organelles. 4. To familiarize cell cycle and cell divisions.				
Unit I	Cell Organization		9 Hours	
Cell theory, structure of Prokaryotic and Eukaryotic cells. Differences in plant and animal cells. Mycoplasma, viruses, virioids and prions.				
Unit II	Biological Membrane		9 Hours	
Fluid Mosaic Model of plasma membrane. Transport across membranes- active and passive transport. Uniport, symport and antiport. Exocytosis and Endocytosis.				
Unit III	Cell Organelles		9 Hours	
Ribosomes-types, structure and functions. Endoplasmic reticulum – types, structure and functions. Golgi apparatus- structure and fuctions.				
Unit IV	Cell Respiration		9 Hours	
Mitochondria : Structure and function. Lysosomes- structures and functions.				
Unit V	Nucleus and Cell Division		9 Hours	
Ultrastructure and functions of nucleus. Cell cycle - phases of cell cycle. Cell division- mitotic and meiotic cell divisions.				
Books for study: 1. Cell Biology and Molecular Biology, N. Arumugam, 8 th edition, Saras Publication, 2014. 2. Cytology- P.S. Verma, V.K.Agaraval, 3 rd edition, S. Chand Publications. Reprint 2001. 3. The Cell- A Molecular Approach – Geoffrey M. Cooper, 8 th edition, Sinauer Oxford University Press, 2019.				
Books for References: 1. Molecular Biology of the Cell- Keith Roberts, 4 th edition, Garland Science Publisher, 2002. 2. Molecular Cell Biology – Lodish, Berk, Zipursky, Baltimore, Freeman Publisher. 2016. 3. Cell and Molecular Biology – E.D.P. De Robertis, 8 th edition, Lea &Febiger Publisher. 2011. 4. Molecular Biology of the Cell, Bruce Alberts, Alexander Johnson, Julias Levis, Martin Raff, Keith Roberts and Peter Walter (2008), 6th ed.. Garland Science, Taylor & Francis Group.				
Course Outcomes (COs)				

By the end of the course, the students will be able to:

CO1 Analyze the structures and basic components of prokaryotic cells.

CO2 Explain the structures and purposes of basic components of eukaryotic cells, especially macromolecules, cytoskeleton, membranes, and organelles.

CO3 Differentiate the difference between prokaryotic and eukaryotic cells.

CO4 Correlate composition and structure of biomembranes, transport mechanisms across biological membranes. Understand how these cellular components are used to generate and utilize energy in cells.

CO5 Describe the cellular components underlying Cell cycle and cell division.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓			✓		✓	✓
CO2	✓	✓			✓		✓	✓
CO3	✓	✓					✓	✓
CO4	✓	✓					✓	✓
CO5	✓	✓			✓		✓	✓

Mapping	57.5%
Matches	23
Correlation	Moderate

Prepared by: P. Mohammed Kashif

Verified by: Dr. A. Liyakath Ali

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBSKB104	Skill Enhancement Course	Professional Communication for Life Sciences	3	3
Course Objectives: 1. To cultivate a good reading habit among students by making them understanding different words so that they become self-reliant and independent reader. 2. To develop the art of writing with grammatically correct english. 3. To improve listening abilities through suitable exercises. 4. To develop oral skill through activities such as discussions, debates, role play and short films. 5. To develop digital competence for effective professional communication.				
Unit I	Reading Comprehension		9 Hours	
Purpose of reading, types, speed, characteristics of good reader. Two subjects based reading text. Reading comprehension activities. Reading texts on advertisement and answering inferential questions. Skimming and scanning				
Unit II	Writing skills		9 Hours	
Writing a paragraph. Summary writing based on reading passages. Dialogue writing. Writing an argumentative/persuasive essay. Writing invitation, circular.				
Unit III	Listening Comprehension		9 Hours	
Listening and hearing. Types of listening. Characteristics of a good listener. Listening to two talks/lectures by specialist on selected subject specific topic and answering comprehension exercises (inferential questions). Listening to a product launch – sensitizing learners to the nuance of persuasive communication. Listening to interviews. Listening activities and task.				
Unit IV	Speaking skills		9 Hours	
Introducing self and others. Icebreaking session, Small group discussions (based on listening and reading passages). Debate – Just A Minute activities. Making and presentation through short films. Role play – activities.				
Unit V	Digital Competence		9 Hours	
Power Point Presentation. Creating blogs, flyer and brochures. Making poster – writing slogan/captions – activities. Short academic presentation using power point presentation. The Science blogosphere.				
Books for study: 1. Communicative English.2020. TANSCHÉ 2. English for life sciences. 2020. TANSCHÉ 3.Percy, R. (2012). Teaching of English. Hyderabad: Neelkamal Publications Pvt. Ltd.				
Books for References: 1.Kumari, A.V (2014). Methods of Teaching English. Guntur: New Era Publications. 2. Dye, D. S. (2012) How to Write a Paragraph, Model Citizen Publications. 3. Writing Effective Paragraphs, The McGraw-Hill Companies, 2013 4. Robert, A. Day and Nancy. (2011). Scientific English – A guide for scientists and other				

professional. Oxford, England

Course Learning Outcomes (CLOs)

By the End the Course, the Students will be able to

CO1. Relate the concepts that may enable them to undertake further studies in life.

CO2. Illustrate scientific contents error free which may fetch them opportunities in communicating scientific research as a science writer.

CO3. Prepare themselves for opportunities in healthcare sectors through active listening abilities.

CO4. Use communication skills to persuasively deliver scientific contents in a professional way.

CO5. Apply technology to articulate scientific contents and communicate it in professional manner.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓			✓		✓	✓
CO2	✓	✓			✓		✓	✓
CO3	✓	✓					✓	✓
CO4	✓	✓					✓	✓
CO5	✓	✓			✓		✓	✓

Mapping	57.5%
Matches	23
Correlation	Moderate

Prepared by: Dr. M. P. Ashar Waheed

Verified by: Dr. A. Liyakath Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBBI2001	Discipline Specific Core Course	Biomolecules	6	6
Course Objectives: 1. To understand the classification of carbohydrates along with their functions. 2. To understand the classification of lipids along with their functions. 3. To understand the classification, structure and functions of amino acids and proteins. 4. To understand the classification of nucleic acids along with their functions				
Unit I	Carbohydrates		20 Hours	
Introduction and functions of carbohydrates. Classification and nomenclature (mono-, di-, oligo-, homopolysaccharides and heteropolysaccharides). Isomerism in carbohydrates (DL, +/-, $\alpha\beta$, epimers, aldose-ketose, pyranose-furanose). Mutarotation. Structure, occurrence & biomedical importance of some carbohydrates (glc, gal, fru, mal, lac, suc, starch, glycogen).				
Unit II	Lipids		20 Hours	
Introduction and functions of lipids. Classification fatty acids (SFA, MUFA, PUFA, odd/even carbon, chain length, essential and non-essential). Classification lipids (simple, complex, derived and precursor lipids). Structure & biomedical importance of some lipids (lecithin, phosphatidylinositol, sphingomyelins, galactoceramide and cholesterol).				
Unit III	Amino acids		20 Hours	
Classification of amino acids based on structure and chemical nature, solubility, nutrition- essential and non-essential, metabolic fate. Properties of amino acids- isomerism, isoelectric pH, Zwitter ion. Selenocysteine and Pyrrollysine (21 st and 22 nd amino acids).				
Unit IV	Proteins		15 Hours	
Functions of proteins. Classification of protein based on function, nutrition, composition and solubility. Structure of peptide bond with ψ and ϕ angle. Bond length. Structures of protein- primary, secondary, tertiary and quaternary. Forces stabilizing protein structure. Denaturation and renaturation.				
Unit V	Nucleic Acids		15 Hours	
Structure of nitrogenous bases (A, T, G, C, U), ribose & deoxyribose, phosphoric acid. Structure and nomenclature of nucleotides. Functions of nucleotides. Structure of DNA- Chargaff's rule, Watson& Crick model. DNA polymorphism. Denaturation. Structure and types of RNA.				
Books for study:				
1. Harper's Biochemistry, Victor W. Rodwell, 31st edition, McGraw Hill, Lange Medical Books, 2021. 2. Biochemistry, U. Satyanarayana, 6th edition, Books & Allied Pvt. Ltd, 2022. 3. Lehninger Principles of Biochemistry, Nelson & Cox, 8th edition, W. H. Freeman & Co., 2021.				
Books for References:				
1. Biochemistry- Lubert Stryer, 6th edition, W. H. Freeman & Company. 2006. 2. Fundamentals of Biochemistry, D.J. Voet, J.G. Voet, C.W. Pratt, 4th edition, John Wiley &				

Sons. 2011.

3. Ambika Shanmugams Fundamentals of Biochemistry for Medical Students, K. Ramadevi, 8th edition, Wolters Kluwer India Pvt. Ltd., 2016.

4. Textbook of Biochemistry, MD Rafi, 4th edition, Universities Press (India) Pvt. Ltd., 2020.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1 Classify carbohydrates along with their functions.

CO2 Identify and name lipids along with their functions.

CO3 Recognize structure, classification and functions of amino acids and proteins.

CO4 Classify and compare nucleic acids along with their functions.

CO5 Recognize the principles of the chemistry connected to living systems and correlate the chemical structure of biomolecules to reactivity.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓		✓	✓		✓	✓
CO2	✓	✓		✓	✓		✓	✓
CO3	✓	✓		✓			✓	✓
CO4	✓	✓		✓			✓	✓
CO5	✓	✓		✓	✓		✓	✓
Mapping				70%				
Matches				28				
Correlation				High				

Prepared by: P. Mohammed Kashif

Verified by: Dr. A. Liyakath Ali

SEMESTER I and II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UABIPR21	Practical	QUANTITATIVE & QUALITATIVE ANALYSIS	3	3
Course Objectives: 1. To explain the principles, theory and procedure for each experiment. 2. To carry out quantitative and qualitative analysis of carbohydrates, proteins and lipids. 3. To calculate and prepare and standardize their solutions individually. 4. To get familiar and develop skills related to biochemistry laboratory.				
I. QUANTITATIVE ANALYSIS i. Estimation of amino acids by formal titration method. ii. Estimation of ascorbic acid by titrimetric method using 2, 6 – Dichlorophenol indophenol. iii. Estimation of reducing sugar from biological fluids by Benedict's titrimetric method. iv. Determination of Acid number of edible oil. v. Determination of Saponification value of edible oil. vi. Iodine value of oil.				
II. QUALITATIVE ANALYSIS i. Reactions of simple sugars including glucose, fructose, galactose, mannose, pentose, maltose, sucrose, lactose, starch, glycogen and dextrin. ii. Reaction of Proteins – Solubility, Denaturation, precipitation by acidic reagents, pH change. Biuret, Millons, Xanthoproteic test. Colour reactions of amino acids like Typtophan. Tyrosine, Cystine, Methionine. Arginine, Proline and Histidine.				
Books for study: 1. Laboratory manual in Biochemistry – Jayaraman, Wiley Eastern Limited, 1981. 2. Biochemical methods – S.Sadasivan and Manickam, 2nd edition, New Age International Publications, 1996.				
Books for References: 1. Practical Clinical Biochemistry – Harold Varley, 5th edition, WH Medical Books, 2002. 2. Medical Laboratory Technology – Kanai L. Mukherjee, 3rd edition, Tata McGraw Hill.,				

Vol. I, II, III. 2017.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Correlate between qualitative and quantitative chemical analysis.
CO2	Analyze carbohydrates and amino acids qualitatively
CO3	Determine acidity and rancidity in edible oil.
CO4	Prepare and standardize chemical solutions.
CO5	Apply the practical skills to analyze biological sample.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓		✓		✓
CO2	✓	✓	✓	✓				✓
CO3	✓	✓	✓	✓				✓
CO4	✓	✓		✓				✓
CO5	✓			✓		✓		✓

Mapping	60%
Matches	24
Correlation	High

Prepared by: Dr. M. P. Ashar Waheed

Verified by: Dr. A. Liyakath Ali

PROGRAM SPECIFIC OUTCOME FOR MASTER OF BIOCHEMISTRY

Knowledge Domain

PSO1. Outline the structure and metabolism of macromolecule and its regulation, disorders of metabolic pathways.

PSO2. Acquire the knowledge of the molecular machinery of living cells, their participation in molecular recognition and signaling.

POS3. Acquire in-depth knowledge of Biochemistry, Microbiology, plant Biochemistry, cell biology, toxicology, physiology, ecology and stem cell.

POS4. Differentiate the principle, instrumentation and applications different analytical techniques used in biochemistry, microbiology, biotechnology, Immunology and molecular biology and able to apply the scientific methods in the research investigation and hypothesis testing.

Skill Domain

POS5. Measure and identify concentration of analytes in the given sample by using biochemical, microbiological and molecular techniques and demonstrate independent and critical skills necessary to formulate specific experiments and obtain reproducible data.

POS6. Make use of modern library research tools and software to locate and retrieve scientific information about technique, bioinformatics, biostatistics, genomic, proteomics.

POS7. Develop effective communication skill (oral and written) to represent the results of the experimental work and research, to pursue career in academic and different life science industries (Pharmaceuticals, Biotech, research, Hospital and community services). Acquire lifelong self learning habits through online courses, ability to plan and manage projects in order to achieve the objective.

Value domain

POS8. Contribute to solve the environmental issues and sustainable development and enhance personal integrity, human rights, women, children and labour rights and ethical behavior when dealing with patients, Community members and the healthcare team.

Mapping PO Vs PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓								
PSO2	✓	✓								
PSO3	✓	✓								
PSO4	✓	✓	✓							
PSO5	✓		✓	✓		✓				
PSO6	✓		✓	✓	✓	✓		✓		
PSO7	✓				✓	✓	✓	✓		✓
PSO8					✓		✓		✓	✓

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBI1001	Discipline Specific Core Course	MICROBIOLOGY AND MICROBIAL TECHNOLOGY	6	5
Course Objectives: 1. To update the knowledge on microbes. 2. To get familiar and develop skill of microbial technology 3. To equip the students to compete for job in clinical labs				
Unit I	INTRODUCTION TO MICROBIOLOGY		18 Hours	
History and scope of microbiology; identification of microorganisms on the basis of morphological, physiological, biochemical, immunological, and molecular characteristics; bacterial classification according to Bergey’s Manual of Systemic Bacteriology; relevance of microbiology to human life; microorganisms as model organisms.				
Unit II	CULTURE TECHNIQUES		18 Hours	
Theory and practice of sterilization, pure culture techniques; construction of culture media; enrichment of culture techniques, isolation and culture of aerobic and anaerobic bacteria; culture collection, preservation and maintenance of microbial cultures. Microbial growth: mathematical expression of growth, growth curve, measurement of growth and growth yields; synchronous growth; continuous culture; environmental factors affecting growth.				
Unit III	MICROBIAL GENETICS		18 Hours	
Plasmids and episomes; transformation (Griffith’s experiment, competent cells); conjugation (U-tube experiment; F+, XF mating;Hfr conjugation, F’ conjugation); transduction (generalized and specialized transduction); transposable elements in bacteria (IS elements).				
Unit IV	FOOD AND INDUSTRIAL MICROBIOLOGY		18 Hours	
Role of microbes in food production - Microbiology of fermented food and dairy products – cheese, yogurt, Alcoholic beverages-beer, wine. Food spoilage and Preservation processes. Microbes as source of food - single cell protein, Application of Microbes in industries production of antibiotics (penicillin), amino acids (Glutamic Acid) organic Acids (citric acid).				
Unit V	MEDICAL MICROBIOLOGY		18 Hours	
Pathogenesis, lab diagnosis, prevention and control of important microbial diseases, Bacterial diseases (Tuberculosis, Leprosy, Typhoid, Pneumonia, Cholerae) - Fungal diseases (Candidiasis, Aspergillosis, Coccidioidomycosis, Pneumocystis Pneumonia), Viral Diseases (HIV, Rabies, Hepatitis) and Protozoan diseases (Malaria, Cryptosporidiosis, Leishmaniasis).				
Books for study: 1. Pelzer, Chan and Kreig. 1986. Microbiology. 5th Edition. McGraw-Hill. 2.Prescott, Harley, Klein. 2003. Microbiology. 5th Edition. McGraw Hill Publication. 3. Bernard R. Glick, T.L. Delovitch, Cheryl L. Pattern, 2014.Medical Biotechnology, ASM Press. 4. Powar and Dagainawala. 2010. General Microbiology. Volume – I. Himalaya Publishing House. 5. Mansi EMTEL and Bryle CFA. 2007. Fermentation Microbiology andBiotechnology. 2 nd Edition, Taylor & Francis Ltd, UK.				
Books for References: 1.Tortora, G.J., Funke, B.R. and Case, C.L. 2012. Microbiology - An Introduction.11 th Edition.				

Pearson Education.

2. Stainer, Ingham, Wheelis and Painter. 1987. General Microbiology. 5th Edition. Macmillan Education, London.

3. A.J. Salle. 1974. Fundamental Principles of Bacteriology. Tata McGraw – Hill Edition.

4. R.W. Old and S.B. Primrose. 1985. Principles of gene manipulation. Blackwell Scientific Publications.

5. Benjamin Lewin. 2006. Genes IX. 9th Edition. Jones and Bartlett publishers.

6. Wolf. Cruzier and AnnaliseCruzer. 2000. Biotechnology Text Book of Industrial Microbiology. Panima Publishing House, New Delhi.

7. Patel, A.H. 2001. Industrial Microbiology, Mac-Millan India Ltd.

8. Waites, M.J. et. al., Industrial Biotechnology: An Introduction, Blackwell publishing, UK, 2007.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Outlining the evolution, physiological and biochemical aspects of microbes.
CO2	Gain knowledge on microbial culture techniques
CO3	Examine the importance of reproduction process in microbes
CO4	Identify and understand industrially important bacteria.
CO5	Organize the knowledge of common infectious diseases

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓					
CO2				✓		✓	✓	
CO3			✓					
CO4				✓	✓		✓	✓
CO5			✓	✓			✓	✓

Mapping	37.5%
Matches	15
Correlation	Moderate

Prepared by: Dr. M.L. Mohammed Kaleem Arshan
Ali

Verified by: Dr.H. Abdul Jaffar

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBI1002	Discipline Specific Core Course	BIOMOLECULES	6	5
Course Objectives: 1. To understand the classification of amino acid and protein, structural organization of protein. 2. To understand structure and function relationship of hetero polysaccharide. 3. To study the structure and types of nucleic acid. 4. To impart knowledge and the structure of lipids, vitamins and their classifications, macro and micro nutrient.				
Unit I	PROTEINS			20 Hours
Amino acids - structure and properties. The peptide bond: The Ramachandran plot - Orders of protein structure. Primary structure- Determination of amino acid sequence of proteins.Secondary structures- α -helix, β -sheet and β -turns. Collagen triple helix.Supersecondary structure- helix-loop-helix, hairpin β motif, Greek key motif and β - α - β motif. Structural classification of proteins based on protein motifs.Tertiary structure- All α , all β , α/β , $\alpha+\beta$ domains. Structural motifs-protein family and superfamily. Quaternary structure – protomers, multimers – rotational and helical symmetry.				
Unit II	GLYCOSAMINOGLYCANS &GLYCOCONJUGATES			15 Hours
Glycosaminoglycans, structure, location and biological role of hyaluronic acid, chondroitin sulphate, keratin sulfate, heparin sulfate, dermatan sulfate and heparin. Sialic acid- structure and significance. Proteoglycans. Glycoproteins and their biological importance, Major classes of glycoproteins. Lectins - structure, function, applications. Blood group antigens and bacterial cell wall polysaccharides.				
Unit III	NUCLEIC ACIDS			20 Hours
DNA double helical structure- Watson and Crick model. A, B and Z forms of DNA. Unusual structures – palindrome, inverted repeats, cruciform and hairpins.DNA supercoiling and linking number. Properties of DNA: buoyant density, viscosity, UV absorption, hypochromic effect, denaturation and renaturation, the cot curve. Differences between DNA and RNA. Major classes of RNA - mRNA, rRNA, tRNA: structure and biological functions. Minor classes of RNA [snRNA,				

miRNA and siRNA].Nucleic acid- binding proteins- DNA and RNA binding motifs in proteins.		
Unit IV	LIPIDS	15 Hours
Fatty acids- saturated, unsaturated and hydroxy fatty acids. Eicosanoids- structure and biological actions of prostaglandins, prostacyclins, thromboxanes, leukotrienes and lipoxins. Phospholipids and glycosphingolipids- structure and biological functions. Steroids- plant and animal sterols. Structure, properties and functions of cholesterol. Lipoproteins- classification and composition. Amphipathic lipids (membranes, micelles, emulsions and liposomes). Lipid and protein composition of bio-membranes.		
Unit V	VITAMINS & MINERALS	20 Hours
Vitamins - water soluble - thiamine, riboflavin, niacin, pyridoxine, folic acid, ascorbic acid- sources, structure, biochemical functions, deficiency diseases, daily requirements; fat soluble - vitamin A, vitamin D2, vitamin E and vitamin K - sources, structure, biochemical functions, deficiency diseases, daily requirements. Minerals - Sources, daily allowance, absorption, metabolism, biological role and clinical significance of calcium, phosphorus, iron, magnesium Copper, zinc, selenium, cobalt, manganese and fluoride.		
Books for study:		
1. Fundamentals of Biochemistry – Voet and Voet. 3rd edition, Wiley 2008. 2. Harper’s illustrated Biochemistry 27th edition 2006, McGraw Hill. 3. Principles of Biochemistry; Smith et al., McGraw Hill.		
Books for References:		
1.Principles of Biochemistry. Lehninger Nelson Cox Freeman Publishers, 2008, 5th ed. 2. Biochemistry Zubay 4th edition 1998 William C.Brown Publication. 3.Fundamentals of Biochemistry by U.Sathyanarayana Revised 3rd Edition Books and allied Pvt ltd. 4.BiochemistryStryer 6th edition Freeman, 2006. 5.Text books of Biochemistry by R.C.Dubey		

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	Ability to demonstrate foundational knowledge of chemistry in biomolecules.
CO2	Ability to outline and exemplify the relation between structure and function of biomolecules
CO3	Ability to analyze the potential of biomolecules that can solve major issues at the forefront of the discipline.
CO4	Ability to extend knowledge on the role of biomolecules for a better understanding of molecular biology tools.
CO5	Discuss the sources, requirements, functions and deficiency disorders of minerals.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓					
CO2		✓	✓	✓	✓			
CO3	✓		✓					
CO4	✓	✓	✓	✓				
CO5	✓	✓	✓	✓				

Mapping	42.5%
Matches	17
Correlation	Moderate

Prepared by: A. Amjad Hussain

Verified by: Dr. A. Liyakath Ali

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIPR11	Discipline Specific Core Practical	MICROBIOLOGY AND MICROBIAL TECHNOLOGY	6	4
Course Objectives: 1. To acquire skills in handling the microbes 2. To perform the various experiments with microbes 3. To get insight in to the microbial techniques learn the isolation, maintenance and preservation of bacteria				
Experiments” 1. Pure culture isolation and maintenance of organisms from soil and water by plating, streaking. 2. Growth curve measurement of bacterial population by turbidometry methods. 3. Microscopic examination of bacteria by Gram stain. 4. Isolation of fungi from soil sample. 5. Analysis of water for portability and determination of MPN(most probable number). 6. Assay of antibiotics production. 7. Biochemical tests to identify various organisms - IMVIC test and TSI. 8. Antibiotics sensitivity test- Disk diffusion-Kirby Bauer method.				
Books for study: 1.Cappuccino, J.H. and Sherman, N. (2014). Microbiology – A Lab Manual (10th ed). Singapore: The Benjamin Publishing Company. 2.Reddy, C. A., Beveridge, T. J., Breznak, J. A., Marzluf, G. A., Schmidt, T. M., & Snyder L. R. (2007). Methods for General and Molecular Microbiology (3rd ed). Washington: American Society for Microbiology. 3.Gunasekaran, P. (1995). Laboratory Manual in Microbiology. New Delhi: New Age International (P) Ltd. Publishers. 4. Gunasekaran, P. 2009. Laboratory Manual in Microbiology. 1st Edition. New AgeInternational Publishers. Reprint 2009. 5. Dr. T. Sundararaj. Microbiology Laboratory Manual. Dr.A.L. MPGIBMS, Universityof Madras, Taramani, Chennai – 600 113.				

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	Demonstrate isolation and maintenance of bacteria.
CO2	Acquire knowledge about preservation of bacteria.
CO3	Distinguish the gram positive and gram negative bacteria
CO4	Apply the knowledge of biochemical reaction to discriminate the bacteria
CO5	Acquire the knowledge on testing of pathogenicity.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1					✓	✓	✓	
CO2					✓	✓	✓	
CO3					✓	✓	✓	
CO4	✓	✓			✓	✓	✓	
CO5					✓	✓	✓	✓

Mapping	45.0%
Matches	18
Correlation	Moderate

Prepared by: Dr. M.L. Mohammed Kaleem Arshan Verified by: Dr.H. Abdul Jaffar Ali

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIPR12	Discipline Specific Core Practical	ISOLATION AND ESTIMATION OF BIOMOLECULES	6	4
Course Objectives: 1. To understand the principles and protocols involved in spectrophotometric analysis, construction of standard curve. 2. To understand colorimetric techniques for the estimations of biological macromolecules and other organic compounds. 3. To apply basic techniques used in the laboratory for isolation/extraction, and purification of biological compounds from their source. 4. To quantify the biological macromolecules.				
1. Isolation and estimation of DNA from biological sample. 2. Isolation and estimation of RNA from yeast 3. Isolation and estimation of Glycogen from liver 4. Isolation and estimation of Ascorbic acid from lemon 5. Estimation of Pyruvate. 6. Estimation of lactate. 7. Estimation of Tryptophan. 8. Estimation of Protein by Lowry's method. 9. Estimation of Protein by Bradford method. 10. Estimation of Inorganic Phosphorus by Fiske and SubbaRao method.				
Books for study: 1. Practical Clinical Biochemistry – Harold Varley, CBS, New Delhi 2. Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill., Vol. I, II, III				
Books for References: 1. Laboratory manual in Biochemistry – Jayaraman 2. Biochemical methods – S.Sadasivan and Manickam				

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	Carryout colorimetric techniques for the estimations of biological macromolecules and other organic compounds
CO2	Apply basic techniques used in the laboratory for isolation/extraction, and purification of biological compounds from their sources
CO3	Quantify the biological macromolecules
CO4	Understand the principles and protocols of spectrophotometric determination of Biomolecules
CO5	Gain expertise in the isolation of various biomolecules and organelles.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1				✓	✓	✓	✓	
CO2				✓	✓	✓	✓	
CO3				✓	✓	✓	✓	
CO4				✓	✓	✓	✓	
CO5				✓	✓	✓	✓	

Mapping	50%
Matches	20
Correlation	Moderate

Prepared by: A. Amjad Hussain Ali

Verified by: Dr. A. Liyakath

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE11	DSE	HUMAN PHYSIOLOGY	6	4
Cours e Objectives: 1. The contents of this course will help students to understand the introduction and importance of general physiology. 2. To understand the anatomical structures and the physiological functions of body systems. 3. Understand and demonstrate the interrelations of the organ systems to each other. 4. To understanding of respiratory, digestive, cardiovascular and muscle physiology, of neurophysiology, reproductive and sense organs.				
Unit I	GENERAL PHYSIOLOGY, BLOOD AND BODY FLUIDS			15 Hours
Blood, blood volume, Blood corpuscles, Hemopoiesis and formed elements, plasma function, blood groups and Rh typing, Blood transfusion, Hemoglobin, immunity, Hemostasis Lymph and Lymphatic system, CSF, Synovial fluid, Amniotic fluid.				
Unit II	RESPIRATORY AND DIGESTIVE SYESTEM			15 Hours
Physiological anatomy of respiratory tract. Comparison of respiration in different species, anatomical transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration. Anatomy of GI tract, Digestion and absorption of carbohydrates, protein, fat, energy balance, BMR.				
Unit III	CARDIOVASCULAR AND MUSCLE PHYSIOLOGY			20 Hours
Comparative anatomy of heart structure, myogenic heart, ECG – its principle and significance, cardiac cycle, Pace maker, heart as a pump, blood pressure, neural and chemical regulation of all above, Pace maker. Classification of muscles. Muscle – types and their mechanism of action.				
Unit IV	REPRODUCTIVE AND EXCRETORY SYSTEM			20 Hours
Reproductive organ - Hormonal regulation of testicular and ovarian function. Spermatogenesis and Oogenesis. Puberty, pregnancy and lactation. Contraceptive methods. Physiology of excretion kidney, urine formation, urine concentration, waste elimination, Diuretics, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance.				
Unit V	NERVOUS SYSTEMAND SENSE ORGANS			20 Hours
Introduction to nervous system. Neurons, action potential, gross neuro-anatomy of the brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture. Nerve impulse, conduction of nerve impulse, synapse, synaptic transmission, neuro macular junction, reflex action. Physiology of vision: Structure of eye, image formation and defects of the eye, Receptor mechanism of the eye, photo pigments, Visual cycle.				
Sense organs – structure of ear, defect of hearing and tactile response.				
Books for study:				
1. Human Physiology 11th Coloured Edition (Volume I and Volume II) by C.C.Chatterjee 1 December 2017.				

2. Human Physiology: An Integrated Approach 5th Edition by Dee Unglaub Silverthorn 2010.
3. Text Book of Medical physiology – Guyton & Hall, 2015.
4. Human Physiology – Dr. N. Arumugam, Saras publications.
5. Review of Medical Physiology, William. F. Ganong, 25th Edition (Lange Medical Book) Paperback – 16 November 2015

Books for References:

1. Human Body in health and Diseases, Barbara Janson Cohen, Jasan J Taylor, Memmler's 10th edition, Lippincott Williams & Wilkins publications.
2. Review of Medical Physiology by William. F. Ganong. McGraw-Hill Medical; 22 edition 2005.
3. Human Physiology & Mechanism of Disease by Guyton MD, Arthur C, 6th edition.
4. Vander's Human Physiology 11th edition, Widmaler, E.P, Raff.H, Strang,K.T McGraw Hill International Publications 2008.
5. Human Physiology 7th edition Fox, S.I. McGraw Hill Publications 2002.
6. A Hand Book of Basic Human physiology- K. Saradha subramanyam, S. Chand & Co., Ltd.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Demonstrate isolation and maintenance of bacteria.
CO2	Acquire knowledge about preservation of bacteria.
CO3	Distinguish the gram positive and gram negative bacteria
CO4	Apply the knowledge of biochemical reaction to discriminate the bacteria
CO5	Acquire the knowledge on testing of pathogenicity.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓		✓			
CO2		✓	✓					
CO3	✓		✓					
CO4		✓	✓					
CO5			✓				✓	✓

Mapping	32.0%
Matches	13
Correlation	Moderate

**Prepared by: K. Muhammed Shariq
Ali**

Verified by: Dr. A. Liyakath

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE13	Discipline Specific Elective Course	Virology	6	4
Course Objectives: 1. To understand the basic concepts of viral structure, classification, gene expression and transmission. 2. To get insight on to the plant, animal and human virus and its significance.				
Unit I	Introduction to General Virology		18 Hours	
General Virology: brief outline on discovery of viruses, Nomenclature and classification, distinctive properties of viruses, morphology and ultra-structure, viroid, Types of Virus, <i>In silico</i> analysis - virus sequence and retrieval.				
Unit II	Viral replication and Genetics		18 Hours	
Virus infection and replication in a host cell: recognition of the host cell, strategies of genomic replication and gene expression in DNA and RNA viruses, control of viral replication, virus assembly, release from the host cell and maturation, genetic variation of viruses.				
Unit III	Human Virology		18 Hours	
General strategies, replication of plus stranded RNA virus, negative strand RNA viruses (VSV and Influenza) Other RNA Viruses Replication of double stranded RNA virus (Rota), ambisense RNA (LCM) and retroviruses (HIV). DNA viruses Replication of double stranded DNA viruses (SV40), ssDNA Virus (AAV) Viral Cancers Role of papilloma HIV, Epstein Barr virus, HTLV and herpes in pathogenesis of cancers, diagnosis, prevention				
Unit IV	Plant Virology		18 Hours	
History of plant viruses, composition and structure of viruses. Plant Virus nomenclature and classification, genome organization, replication and movement of viruses. Symptomatology of important plant viral diseases, transmission, chemical and physical properties, host virus interaction, plant virus vector relationship.				
Unit V	Animal Virology		18 Hours	
History and scope of Veterinary Virology, Viruses and their properties, Structure of capsid, symmetry, viral envelopes, Virion structure and functional relationship. DNA VIRUSES : Poxviridae, Herpesviridae, Adenoviridae, Papillomaviridae, Circoviridae: Flaviviridae, Rhabdoviridae, Coronaviridae, Prions example symptoms and treatment				
Books for study:				
1.Virology by P.Saravanan, 2017 MJP Publishers 2. Encyclopedia of virology third edition, Dr Brian W J Mahy and Dr Marc H Van Regenmortel 3. Basic Virology Third Edition Edward K. Wagner				
Books for References:				
1. Virology Principles & Application by John B. Carter 2.Plant Virology by Roger Hull John Innes CentreNorwich, UK 3.Kayser, Medical Microbiology 2005				

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	Students will learn to differentiate between types of viruses and their role in disease.
CO2	Describe and will learn about replication and genetic variation of viruses
CO3	Explain the rationale behind the classification system of viruses and present example viruses for each group and diagnosis, prevention of viral diseases on human
CO4	Explain Plant Virus nomenclature and classification, important plant viral diseases, and its properties
CO5	Describe virion structure and functional relationship on animal virus , symptoms and treatment with example of viral families

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓		✓	✓				
CO2	✓		✓	✓				
CO3	✓		✓	✓			✓	✓
CO4	✓	✓	✓	✓				
CO5	✓		✓	✓			✓	✓

Mapping	50.0%
Matches	20
Correlation	Moderate

Prepared by: S. Zakirullah

Verified by: Dr.H. Abdul Jaffar Ali

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE12	Dicipline Specific Electetive Course	STEM CELL TECNOLOGY	6	4
Course Objectives: 1.To impart basic understanding of stems cells and its types 2. To get knowledge in the development of embryonic stem cells 3. To learn the techniques of creating adult stem cells. 4. Outline the manipulation of stem cells for drug development 5. To have knowledge about the application of stem cells in medicine and health.				
Unit I	STEM CELL BASICS			18 - Hours
Stem Cells sources - Unique properties of stem cells – embryonic stem cells - adult stem cells – umbilical cord stem cells – similarities and differences between embryonic and adult stem cells. Properties of stem cells – pluripotency and totipotency.				
Unit II	EMBRYONIC STEMCELLS			18 - Hours
<i>In vitro</i> fertilization –culturing of embryos-isolation of human embryonic stem cells – blastocyst – inner cell mass –growing ES cells in lab – laboratory tests to identify ES cells – stimulation ES cells for differentiation – properties of ES cells. Applications of Embryonic stem cells.				
Unit III	ADULT STEM CELLS			18 - Hours
Somatic stem cells – test for identification of adult stem cells – adult stem cell differentiation – trans differentiation –plasticity – different types of adult stem cells-liver stem cells-skeletal muscle stem cells-bone marrow derived stem cells.				
UnitIV	STEM CELL IN DRUG DISCOVERY AND TISSUE ENGIEERING			18 - Hours
Target identification – Manipulating differentiation pathways – stem cell therapy vs cell protection - stem cell in cellular assays for screening – stem cell based drug discovery, drug screening and toxicology - tissue engineering application – production of complete organ - kidney – eyes - heart – brain.				
Unit 5	GENETIC ENGINEERING AND THERAPEUTIC APPLICATION OF STEM CELLS			18 - Hours
Gene therapy – genetically engineered stem cells – stem cells and Animal cloning – transgenic animals and stem cells. Therapeutic applications – Parkinson disease - Neurological disorder – limb amputation – heart disease - spinal cord injuries – diabetes –burns - HLA typing- Alzheimer’s disease.				

Books for study):
1. Potten.C S, “<i>Stem Cells</i>,” Elsevier, 1996. 2. <i>Embryonic Stem cells</i> by Kursad and Turksen. 2002. Humana Press. 3. <i>Stem cell and future of regenerative medicine</i>. By committee on the Biological and Biomedical applications of Stem cell Research.2002.National Academic press. 4. Robert Lanza, “<i>Essentials of Stem Cell Biology</i>,” Academic Press, 2009.
Books for References:
1. Peter Quesenberry, “<i>Stem cell biology and Gene Therapy</i>,” Wiley-Liss, 1998. 2. Daniel R. Marshak, “<i>Stem cell biology</i>,” Cold Spring Harbor Laboratory Press, 2001. 3. AriffBongso, EngHin Lee, “<i>Stem Cells: From Bench to Bedside</i>,” World Scientific, 2011.

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	To illustrate the implications of the functioning of genes in stem cells
CO2	Describe basic concepts in stem cell biology, including origin and plasticity.
CO3	Differentiate between embryonic and adult stem cells, and describe their characteristics.
CO4	Analyze the applications of stem cell genetics including for tissue engineering and in vitro directed differentiation purposes.
CO5	Discuss potential therapeutic applications of stem cells.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1		✓	✓	✓				
CO2		✓	✓	✓				
CO3			✓		✓	✓	✓	✓
CO4			✓	✓	✓	✓	✓	✓
CO5			✓				✓	✓

Mapping	50.0%
Matches	20
Correlation	Moderate

Prepared by: A. Amjad Hussain

Verified by: Dr. A. Liyakath Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBI2001	Discipline Specific Core Course	BIOENERGETICS AND INTERMEDIARY METABOLISM	5	5
Course Objectives: 1. Energy transformation and conversation, unidirectional flow of energy and elements recycling. 2. To learn metabolic pathways of Biomolecules. 3. Understand the interrelationship between the pathways and the mechanisms of regulation. 4. Major catabolic and anabolic pathways in metabolism of carbohydrates, lipids, amino acids and nucleotides.				
Unit I	BIOENERGETICS AND INTRODUCTION TO METABOLISM		15 Hours	
Thermodynamics: laws of thermodynamics and its applications. Enthalpy and entropy. Mechanism of exergonic and endergonic reactions, redox potential, high energy compounds - ATP, Creatine. Role of NADH and NADPH in metabolism. The electron transport chain- organization of respiratory chain complexes I, II, III, IV and electron flow and oxidative phosphorylation, ATP synthase and mechanism.				
Unit II	CARBOHYDRATE METABOLISM		15 Hours	
Overview of glycolysis.The citric acid cycle and regulation.The pentose phosphate pathway and uronic acid pathway.Glycogenesis, gluconeogenesis, Glycogenolysis its Regulation.Metabolism of glycogen and regulation.The glyoxylate cycle.Cori cycle.				
Unit III	LIPID METABOLISM		15 Hours	
Biosynthesis of fatty acids – Fattyacid synthase complex – regulation of lipogenesis. Role of carnitine in fatty acid oxidation. α , β and ω -oxidation of fatty acids. Ketone body formation and their clinical significance. Biosynthesis of triacylglycerols, phospholipids and sphingolipids. Biosynthesis and regulation of cholesterol.				
Unit IV	AMINO ACID AND PROTEIN METABOLISM		15 Hours	

Biosynthesis of nutritionally nonessential amino Acids. Conversion of amino acids to specialized products. Catabolism of amino acid nitrogen- transamination, deamination, ammonia formation and the urea cycle.		
Unit V	NUCLEOTIDE METABOLISM	15 Hours
Biosynthesis of purine nucleotides and its regulation. Biosynthesis of pyrimidine nucleotides and its regulation. Degradation of purine and pyrimidine nucleotides.		
Books for study:		
1. Harper's Biochemistry, Murray, Granner, Mayes, Rodwell 25th Edition. McGrawhill Co. 2. Davidson and Sittman 1999. Biochemistry NMS 4th edition. Lippincott. Williams and Wilkins.		
Books for References:		
1. Stryer. Biochemistry. Freeman. 6th ed. 2006. 2. Nelson Cox. Lehninger's Principles of Biochemistry. 5th ed. Freeman, 2008. 3. Donald Voet, J.G. Voet, John Wiley, Biochemistry, 3rd edition 2008. 4. Kuchel and Ralston. Biochemistry. 2nd ed. Schaum's Outlines McGraw Hill, 2006. 5. Davidson and Sittman. Biochemistry NMS. 4th ed. Lippincott. Williams and Wilkins, 1999. 6. Campbell and Farrell. Biochemistry 4th ed. Brooks/Cole Pub Co. 2002. 7. Elliot and Elliot. Biochemistry and Molecular biology 3rd edition Oxford University Press Inc, 2005. 8. Zubey Biochemistry 4th edition, WCB Publishers, 1998.		

Course Outcomes (COs)	
By the end of the course, the students will be able to:	
CO1	Demonstrate the fundamental energetics of biochemical processes, chemical logic of metabolic pathways.
CO2	Knowing in detail about concepts to illustrate how enzymes and redox carriers and the oxidative phosphorylation machinery occur.
CO3	Elucidate the metabolic pathways, the energy yielding and energy requiring reactions in living systems.
CO4	Illustrate the metabolism of carbohydrates through various anabolic and catabolic pathways like glycolysis, Krebs' cycle, Glycogen metabolism, glucuronic acid cycle etc.
CO5	Ability to analyze the potential of biomolecules that can solve major issues at the forefront of the discipline.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓					
CO2	✓	✓	✓					
CO3	✓	✓	✓					
CO4	✓	✓	✓					
CO5	✓	✓	✓				✓	✓

Mapping	42.5%
Matches	17
Correlation	Moderate

**Prepared by: K. Muhammed Shariq
Ali**

Verified by: Dr. A. Liyakath

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBT2002	Discipline Specific Core Course	Immunology and Immunotechnology	6	5
Course Objectives: By the end of the course, learners should have a knowledge of: 1. Immune system and its significance 2. Various basic and advanced techniques involved in immunology. 3. Role of immune system in human disease management.				
Unit I	INTRODUCTION & ORGANIZATION OF IMMUNE SYSTEM		18 Hours	
Introduction to immunology: Symbols, organs of immune system- Lymphoid organs. Immunity types – Innate and acquired immunity, Cells of immunity – NK cells, LAK, Macrophages, Neutrophils and Eosinophils.Determinants of innate immunity. Acquired immunity – humoral and cell mediated immunity, development and mechanism. Hematopoiesis.				
Unit II	ANTIGEN & ANTIBODIES		18 Hours	
Antigens: Definition, criteria for antigenicity, Epitope, Paratope, Haptens. Classification of antigen based on Chemical nature, mode of action, and antigenic determinant. Antibodies: Basic Structure, Classes, Subclasses of Immunoglobins, biological functions, Monoclonal antibodies - Production and applications. Tumour antigens, immune prophylaxis and immune therapy- Vaccines and their types.				
Unit III	COMPLEMENT SYSTEM& HYPERSENSITIVITY		18 Hours	
Complement: Definition, components, activation, pathways of activation – classical complement pathway and Alternative complement pathway. HLA/MHC complex, Hypersensitivity – definition, Classification based on coombs and gel, Types of hypersensitivity – type I, II, III, IV, V and their mechanisms.				
Unit IV	TRANSPLANTATION IMMUNOLOGY& IMMUNE DISEASES		18 Hours	
Transplantation of Immunology – Immunology of Graft Rejection, Methods of Graft Rejection – Tissue and Organ Transplantation and its Ethics– Immunosuppressive agents – Immunology of Tolerance. Immunology of Tumors –Tumor Antigens, AutoImmune Diseases, Immunodeficiency Diseases.				
Unit V	IMMUNOTECHNOLOGY		18 Hours	

Techniques based on antigen- antibody reactions and their applications - Agglutination test and its type, Precipitation, Complement fixation test, immuno assays using labelled reagents immunofluorescence, ELISA, RIA, RAST and RIST, western blotting. Commonly used immunological tests – ASO, WIDAL, VDRL, RPR, and TPHA.

Books for study:

1. Kuby J, Cameron J, Todd C, Mitchell J, Immunology, W.H. Freeman and Co., 2000.
2. Elgert KD, Immunology: Understanding Immune system, John Wiley and Sons, 1996.
3. CV Rao, Immunology – A text book, Narosa Publications, 2011.

Books for References:

1. Ivan M.Rohit (1994). Essential Immunology – Blackwell Scientific Publications
2. Oxford Kuby J (1997) Immunology –WH Freeman and Company, New york.
3. Richard M hyde (1995), Immunology III edition. National Medical Series, Williams and Wilkins. Harward Publishing Company.
4. <https://www.sciencedirect.com/book/9780128098196/immunology>
5. Primer to the Immune Response, 2014, (2ND Edition), Tak W. Mak, Mary, E. Saunders and Bradley D. Jett. Elsevier Inc., Amsterdam.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Get familiarity of Immune system and its attributes
CO2	Get the significance of cellular coordination in the generation of immune responses.
CO3	Insight into the roles of molecules of the major histocompatibility complex and their
CO4	Function and role of hypersensitivity mechanism in immune system.
CO5	Crucial role of transplantation immunology techniques and its ethics with respect to immune disorder

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓					
CO2	✓	✓	✓					
CO3	✓	✓	✓				✓	✓
CO4			✓	✓			✓	✓
CO5			✓	✓	✓		✓	✓

Mapping	50.0 %
Matches	20
Correlation	Moderate

Prepared by: Dr. S.U.Mohammed Riyaz

Verified by: Dr.H. Abdul Jaffar

Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIPR21	Discipline Specific Core Practical	BIOCHEMICAL ANALYSIS OF BLOOD AND HEMATOLOGY	6	4
Course Objectives: 1. To understanding the concept of Biochemical analyzing instruments, chemicals and normal ranges of biochemical components in our body. 2. Clinically relevant biochemical analysis for deeper understanding of all biochemical components i.e., Proteins, glucose, urea etc 3. To learn quantitative analysis of constituents of biological fluids such as blood and their estimation using standard methods. 4. The students understand and recognise the pathologies behind benign and malignant disorders of erythrocytes, leucocytes and thrombocytes and to provide in depth knowledge about the pathology and pathophysiology of haematological disorders.				
I. BIOCHEMICAL ANALYSIS OF BLOOD 1. Collection and preservation of blood sample from artery, vein and capillary puncture 2. Estimation of glucose by GOD & POD method 3. Estimation of Glucose by Orthotoulidine(OT) method. 4. Estimation of protein by Bradford's method 5. Estimation of blood urea by DAM method 6. Estimation of serum creatinine by Alkaline picrate method. 7. Estimation of blood uric acid. 8. Estimation of serum cholesterol by Zaks method. 9. Estimation of serum bilirubin. By Diazo benzoic method. 10. Estimation of Inorganic Phosphorous By Fiske Subbarows Method. 11. Estimation of calcium by Clarke and Collip method. 12. Demonstration of Auto Analyser.				
II. HEMATOLOGY 1. Microscopy 2. RBC count & WBC count 3. Differential leucocyte count by Leishman's staining 4. Estimation of Haemoglobin by Sahli's acid haematin method 5. Determination of Packed cell volume (PCV) 6. Calculation of Blood indices				

7. Determination of Erythrocyte sedimentation rate (ESR)
8. Determination of Coagulation time & Bleeding time
9. Determination of blood group
10. Determination of Blood Pressure by Sphygmomanometry
11. Demonstration of Cell counter

Books for study

1. J. Jayaraman, Laboratory Manual in Biochemistry. New Age International Pvt Ltd Publishers. 2011 (Paperback).
2. S. K. Sawhney, Randhir Singh, Introductory Practical Biochemistry. Alpha Science International, Ltd. 2 edition, 2005.
3. Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill., Vol. I, II, III

Books for References:

1. Harold Varley, Practical Clinical Biochemistry, CBS. 6 edition, 2006.
2. S. Sadasivam, A. Manickam, Biochemical Methods. New age publishers. 2009
3. Standard Methods of Biochemical Analysis, S. K. Thimmaiah (ed), Kalyani Publishers, Ludhiana.
4. Clinical Laboratory-methods and diagnosis, Vol-I Grad Wohl.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Discuss different principles behind clinical biochemistry experiments
CO2	Analyze the experimental data and relate it with clinical parameters.
CO3	Carry out the experiments and interpret the results. Calculate cell count and predict the viability.
CO4	Apply knowledge and skills associated with clinical pathology, Identify pathological processes and correlating these with the clinical symptoms and sign
CO5	To learn normal ranges and abnormal ranges of biochemical components and hematological parameters.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1				✓	✓	✓	✓	✓
CO2				✓	✓	✓	✓	✓
CO3				✓	✓	✓	✓	✓
CO4				✓	✓	✓	✓	✓
CO5				✓	✓	✓	✓	✓

Mapping	62.5 %
Matches	25
Correlation	High

Prepared by: A. Amjad Hussain

Verified by: Dr. A. Liyakath Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTPR22	Discipline Specific Core Practical	Practical - Immunology and Immunotechnology	5	4
Course Objectives: By the end of the course, learners should be able to 1. Understand and apply the principles and techniques of immunology 2. Demonstrate the basic knowledge of immunological process like antigen preparation. 3. Learn about the immunological test of different pathological disease. 4.Understand the principles and significance of various immunological techniques and various diagnostic assays.				
1.	Antigen Preparation – Heat treatment			
2.	Antigen Preparation - Chemical treatment			
3.	WIDAL test			
4.	VDRL test			
5.	Single Radial Immuno diffusion test			
6.	Double Immuno diffusion test/Ouchterlony double immunodiffusion			
7.	ELISA			
Books for study: 1. Manual of Practical Immunology- Aruna Bhatia, Paramount Publication. 2. Biotechnology Lab Practicals- Debajit Borah, Global Vision Publishing House 2012. 3. Roitt I, Brostoff, Male, Immunology, Mosby Publications, 2001				
Books for References: 1. Leffel, Donnenberg, A: and Rose, W. (1997) Hand book of human Immunology Boca Raton Fla: C.R.CPress. 2. Frank, C. Hay &Olwyn, M. R. Westwood (2002). Practical immunology. (4th ed.), London: Blackwell Scientific Publication.. 3.Practical Immunology – RabindraNarian, (2012).Wisdom Publisher.				

4. Paul, Fundamental of immunology. 1999, 4th Edition, Lippcott Raven.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Prepare antigens by various methods.
CO2	Demonstrate the diagnostic assays for particular immune diseases by advanced technologies.
CO3	Perform and identify diseases like typhoid and vulnerable diseases by laboratory skills.
CO4	Perform and Analysis sensitive experiments like immunodiffusion tests.
CO5	Apply and procure employment in health care field by developing skills to do ELISA test

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1					✓	✓	✓	
CO2					✓	✓	✓	
CO3					✓	✓	✓	
CO4					✓	✓	✓	
CO5					✓	✓	✓	✓

Mapping	40.0 %
Matches	16
Correlation	Very high

Prepared by: Dr. S.U.Mohammed Riyaz

Verified by: Dr.H. Abdul Jaffar Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE21	DSE	BIO-ANALYTICAL TECHNIQUES	6	4
Course Objectives: At the end of this course the student will able to: Illustrate the principle of instrumentation, and applications of the analytical tools of biochemistry like spectroscopy, electrophoresis, chromatography, radioisotopic techniques and centrifugation technique				
Unit I	SPECTROSCOPY		15 Hours	
Laws of absorption and absorption spectrum. Principle, instrumentation and applications of UV-visible spectrophotometer, spectro-fluorimetry, Luminometry, Atomic absorption spectroscopy,Flame emission spectrophotometry and Circular dichroism spectroscopy. Basic principles of mass spectrometry, NMR, X-ray diffraction and their biological applications.Basics of laser techniques.				
Unit II	RADIOISOTOPE TECHNIQUES		15 Hours	
Nature and units of radioactivity. Types of radioactive decay, Detection and measurement of radioactivity- counter based on gas ionization, Geiger- Muller counter, solid and liquid scintillation counting. Autoradiography. Radioimmune assay. Applications of radioisotopes in biology- Radiation hazards & safety aspects.				
Unit III	ELECTROPHORESIS & BLOTTINGTECHNIQUES		15 Hours	
Electrophoresis: General principles. Electrophoresis of proteins- SDS-PAGE, native gels, isoelectric focusing, Cellulose acetate electrophoresis. Electrophoresis of nucleic acids- agarose gel electrophoresis, pulsed-field gel electrophoresis.Two-dimensional polyacrylamide gel electrophoresis Blotting techniques: Southern, Northern and Western blotting techniques.				
Unit IV	CHROMATOGRAPHY		15 Hours	
Principle, Column chromatography, instrumentation and applications of thin layer chromatography, ion-exchange chromatography, Molecular exclusion chromatography and Affinity chromatography, gas liquid chromatography. Principle, instrumentation and applications –High performance liquid chromatography (HPLC), reverse phase chromatography (RPC).				

Unit V	CENTRIFUGATION & TISSUE FRACTIONATION	15 Hours
Basic principles of sedimentation. calculation of centrifugal field, types of centrifuges, Types of rotors, preparative centrifugation, differential centrifugation, Density-gradient centrifugation. Subcellular fractionation by differential centrifugation. Analytical centrifugation, Applications of analytical ultracentrifugation. Care and maintenance of centrifuges. Cell disruption, homogenization and extraction of membrane bound proteins-cell disruption methods – organ and tissue slice techniques.		
Books for study:		
1. Practical Biochemistry by Wilson and Walker. 5th edition Cambridge Univ 2005. 2. Introductory Practical Biochemistry (Narosa, 2000) by Shawney & Randhir Singh. 3. Instrumental methods of analysis in biotechnology. Dinesh Kumar Chatanta, Prahlad Singh Mehra L.K. International publishing house. Pvt Ltd.		
Books for References:		
1. Physical Biochemistry by David Friefelder, W.H. Freeman 2nd edition (1982). 2. Introduction to Medical Laboratory Techniques by Mukherjee, Volume I, II & III. 3. Introduction to instrumental analysis by Robert D. Brown, Pharma Book Syndicate (2006). 4. Boyer, R. Modern Experimental Biochemistry. 3rd ed. Addison Wesley Longman, 2000. 5. Upadhyay, Upadhyay and Nath. Biophysical Chemistry Principles and Techniques. Himalaya Publ. 1997 6. Sambrook. Molecular Cloning. 2nd edition. Cold Spring Harbor Laboratory, 2001. 7. David Friefelder Physical Biochemistry – Applications to Biochemistry and Molecular Biology. WH Freeman & Co. 2nd edition 1999.		

Course Outcomes (COs) By the end of the course, the students will be able to:	
CO1	Differentiate the principle, instrumentation and applications spectroscopy.
CO2	Assess the radio isotopic techniques like gas ionization, Geiger- Muller counter, solid and liquid scintillation counting.
CO3	Compare the different electrophoretic techniques with its applications
CO4	Compare the different chromatography techniques with its advantage and disadvantages.
CO5	Choose the proper centrifugation techniques for separating and analyzing the subcellular organelles and biomolecules.

MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1				✓		✓	✓	✓
CO2				✓		✓	✓	✓
CO3				✓		✓	✓	✓
CO4				✓		✓	✓	✓
CO5				✓		✓	✓	✓

Mapping	50 %
Matches	20
Correlation	Moderate

Prepared by: Dr. M. L. Arbab Sikandar

Verified by: Dr. A. Liyakath Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE22	Core based elective	PROTEOMICS AND GENOMICS	06	04
Intsructional Objectives 1. Teach the basic concepts in genome analysis. 2. Apply knowledge of genomics and proteomics in analytical studies. 3. Correlate between genome and proteome. 4. Relate procedure and techniques for drug designing.				
Unit 1	Proteomics			15 Hours
Proteomics: Identifying proteins in complex mixtures: Protein profiling, quantitative 2D GE, multidimensional chromatography, quantitative mass spectrometry, MALDI – TOF, TOF analysis and analytical protein chips. Protein structure databanks- protein databank.				
Unit 2	Genome Structure			15 Hours
Organisation and structure of genomes, Genome sizes- microbial and organelle genomes - Centromeres and telomeres, tandem repeats- dispersed repeats (transposons). Basic Sanger sequencing - automated sequencing- sequencing simple genomes - Sequencing large genomes - finalizing sequences – resequencing and Next generation sequencing (NGS).				
Unit 3	Microarray & genome database			15 Hours
Microarray: DNA Micro array, Protein Micro array Transcriptomics, Applications and advantages of Micro arrays- DNA chips and SAGE technology- Organization of genome projects- human, plant, animal and microbial genome. Genome databases; Annotation of genome.				
Unit 4	Human Genome			15 Hours
Human Genome: Important genes associated with each chromosomes - Mendelian and sex linked traits in human inheritance. Genetic diseases due to defects in autosomal and sex linked genes. Whole genome sequencing – Human Genome Project.				
Unit 5	Pharmacogenomics and New Drug Design			15 Hours
Phamacogenomics and New Drug Design: Need for developing new drugs: Procedure followed in drug design; Molecular modification of lead compounds; Prodrug and soft drugs; Physico-chemical parameters in drug design; QSAR. Applications of proteome analysis to drug development and toxicology, Phage antibodies as tools for proteomics.				
Books for study (Text Books):				
1. Necia Grant Cooper; (Ed.). The Human Genome Project; Deciphering the blueprint of heredity University Science books, CA, USA. (1994). 2. Gary Zweiger. Transducing the Genome; Information, Anarchy and Revolution in Biomedical				

Sciences. Tata McGraw-Hill Publishers, New Delhi. (2003).

3. Branden, C and J. Troze. Introduction to Protein Structure. Second Edition. Garland Publishing, New Delhi. (1999).

4. Evans W.E. and Relling, M.V. Pharmacogenomics: translating functional genomics into rational therapeutics. Science 286:487. (1999).

5. Principles of Genome analysis and Genomics, 3rd Edition, By S. B. Primrose and R. L. Twyman, Blackwell publishing (2003).

6. S. B. Primrose and R.M. Twyman - Principles of Genome Analysis and Genomics, 7th Edition, Blackwell Publishing, 2006.

Books for References:

1. Baxevanis, A.D and Ouellette, B.F.F. Eds. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. Wiley Interscience. New York. (2001).

2. Higgins, D and Taylor, W (Eds). Bioinformatics: Sequence, Structure and Databnks. Oxford University Press, Oxford. (2000).

3. Principles and Practices of Plant Genomics (Volume 3), By ChittaranjanKole and Albert G. Abbott. CRC Press (2017).

4. Genome Analysis: Current Procedures and Applications by Maria S. Poptsova. Caister Academic Press (2014).

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Define human genome database and sequences.
CO2	Apply proteomics approaches for protein sequencing and analysis.
CO3	Analyze the structural and functional genomics approaches for functional characterization of genes.
CO4	Design the experiments using different techniques of genome sequencing.
CO5	Apply the knowledge of pharmacogenomics for drug design.

**MAPPING COURSE OUTCOME (COs) WITH PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓		✓	✓				✓
CO2			✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓			
CO4				✓	✓	✓		
CO5	✓	✓	✓				✓	✓

Mapping	55%
Matches	22
Correlation	Very high

Prepared by: K. Muhammed Shariq

Verified by: Dr. A. Liyakath Ali

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTDE23	DSE2	CANCER BIOLOGY	6	4
Course Objectives: 1. To learn the various types of cancer and its detection method. 2. To understand the carcinogens and its effect. 3. To get knowledge regarding the role of molecular tools in the treatment of cancer. 4. To have knowledge about the treatment of cancer with advanced methodology.				
Unit I	Fundamentals of Cancer Biology		18 Hours	
Introduction to Cancer- History of Cancer-Causes of Cancer - different forms of cancer – detection of Cancer, early screening method – detection using biochemical assay – Tools for detection of cancer – Tumor markers – molecular tools for early diagnosis of cancer – Hereditary cancers.				
Unit II	Carcinogenesis		18 Hours	
Carcinogenesis definition – stages and types of carcinogenesis- carcinogen and its effect – theory of carcinogenesis - Physical & Chemical carcinogens and its effect, major classes of chemical carcinogens - mechanism of various types of radiation carcinogenesis – mutagens and mutation.				
Unit III	Molecular Cell Biology for Cancer		18 Hours	
Role of molecular biology in the treatment of cancer – Discovery of oncogenes, types of oncogenes – detection & identification of oncogenes - Role & mechanism of oncogenes activation - Molecular tools for identification of cancer genes - Tumor suppressor genes, Role of Telomerases in cancer, single nucleotide polymorphism (SNP) in cancer.				
Unit IV	Principle of Cancer Metastasis		18 Hours	
Metastasis definition- Stages and Mechanism of metastasis - Angiogenesis, Role of angiogenesis in cancer, Invasion- classification and significance of metastasis - Protease and tumor cell invasion – basement membrane, development & progression of carcinomas.				
Unit V	Cancer Therapy		18 Hours	
Clinical diagnosis of cancer – different forms of therapy - chemotherapy, History and advantages - Radiotherapy – gene therapy, types and risks of gene therapy – advancement in the treatment of cancer - signals target towards cancer therapy, Advanced treatment of cancer - CRISPR, artificial intelligence, nanotechnology andtelehealth.				
Books for study:				

1.Cancer Biology, a Study of Cancer Pathogenesis.Publisher: **Xlibris**, November 23rd, 2011

Pages: 152

2.The Textbook of Cancer Biology, (Paperback, Dr. Pradeep Kumar) Publisher:Prachi Digital.2022

3.Principles of Cancer Biology by Lewis J Kleinsmith, Pearson. **1st Edition**

Books for References:

1. Cancer Biology – Fourth edition – Raymond W. Ruddon - Michigan

2. Cancer System Biology – Edwin Wang - CRC Press -UK

3.Introduction to Cancer Biology, Hesketh Robin, Cambridge University Press, February 2013

4. Cancer Biology – Third Edition, Pearson Education (US) - 2006-05-11

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1	Understand the various types of Cancer and carcinogens.
CO2	Learn the various molecular tools used in the treatment of cancer.
CO3	Understand the major significance of cancer and its effect.
CO4	Know the basic principles behind personalized medicine and therapeutic cancer management
CO5	Know about the different types of therapy used for the treatment of Cancer.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (CO)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1			✓	✓				
CO2				✓	✓	✓	✓	✓
CO3		✓	✓	✓			✓	✓
CO4							✓	✓
CO5			✓	✓	✓			✓

Mapping	45.0%
Matches	18
Correlation	Moderate

Prepared by: M. Mohammed Zeeshan

Verified by: Dr.H. Abdul Jaffar Ali

**DEPARTMENT OF
BIOTECHNOLOGY
UG & PG SYLLABI**

Programme Specific Outcomes for B.Sc Biotechnology:

Upon completion of the B.Sc Biotechnology programme, the students will be able to:

PSO 1: Acquire sound and solid base in local as well as national languages and on the fundamental principles and the scientific theories related to various spheres of Biotechnology with technological applications.

PSO 2: Apply biotechnology skills with global competencies in core and allied fields.

PSO 3: Integrate technologies through inter-disciplinary concepts and suggest better solution to solve issues of underprivileged.

PSO 4: Utilize ICT for learning and experimenting in pursuance of modern technology and concepts.

PSO 5: Developing a variety of communication skills such as reading, listening, speaking, etc. helps to express ideas clearly and effectively.

PSO 6: Conceive the concepts and research approaches to pursue higher studies/attain higher career in industry, medical and other relevant fields of biotechnology both locally and nationally and develop their scientific tempo.

PSO 7: Become entrepreneurs and technologists with strong ethics and technical skills.

PSO8: Find out the biosolutions for the cross cutting issues in a global, economic, environmental, and societal context.

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBBT1001	Discipline Specific Core Course	Cell and Molecular Biology	3	3
Course Objectives: The aim of the course is to 1. Understand the cell and molecular biology of all microorganisms, plants and animals. 2. Differentiate genome organization in the major groups of organisms. 3. Know how these cellular components are used to generate and utilize energy in cells. 4. Describe how genes are expressed and occurrence of mutation and its types.				
Unit I	Introduction to basics of cell and its types			9Hours
History of cell – Definition of cell - cell theory, protoplasm theory and organismal theory - broad classification of cell types: prokaryotic and eukaryotic cells and their similarities and differences.				
Unit II	Cell structures and its functions			9 Hours
Size, shape and structure: Plant cell – animal cell – yeast cell – chlamydomonas – Plant cell wall - fungal cell wall- exocytosis, endocytosis - phagocytosis-vesicles and their importance in transport.				
Unit III	Cell Organelles – Structure and Function			9 Hours
Definition, Structure and function – Plasma membrane , Nucleus, Cytoplasm, Mitochondria, Ribosomes, Endoplasmic Reticulum, Golgi apparatus, Lysosomes, Cytoskeleton structure – microtubules, microfilaments and intermediate filament, Centrioles, Peroxisomes, Cilia, Flagella, Endosomes, Vacuoles, Microvilli				
Unit IV	Cell cycle, Mechanism and Regulation			9 Hours
Cell cycle and cell division (mitosis and meiosis), DNA structure and types - Mechanism of DNA replication – enzymology of DNA replication–RNA and its types.				
Unit V	Gene expression and mutation			9 Hours
Protein Synthesis - transcription and translation, Regulation of Gene Expression – lac Operon concept. DNA damage and repair mechanism - Gene mutation and its Types.				
Books for study:				
1.Verma P.S. and Agarwal V.K. (2016) Cell Biology (Cytology, Biomolecules, Molecular Biology), S.Chand and Company Ltd. 2. S. Arumugam (2019), Cell and Molecular Biology, Saras publication. 3. P.K. Gupta (2018), Cell & Molecular Biology, Rastogi Publications.				
Books for References:				
1. Cooper G.M. (2019) The Cell – A Molecular Approach, 8th Edn. Sinauer Associates Inc., Oxford University Press p.813. 2. Alberts B., Johnson B., Lewis J., Morgan D., Raff M., Roberts K. and Walter P. (2015) Molecular biology of cell, 6th Edn. Garland Science, Taylor and Francis, p. 1465. 3. Mason K.A., Losos J.B. and Singer S.R. (2011) Raven and Johnson’s Biology. 9th Edn. McGraw Hill publications. p.1406. 4. Lodish. Molecular Cell Biology 8 th Edn 2016 Edition, Freeman Macmillan				
Course Outcomes (COs) By the End the Course, the Students will be able to				

- CO1** Exhibit a fundamental knowledge base in genetics, cell and molecular biology, and anatomy and physiology.
- CO2** Exhibit clear and concise communication of scientific data.
- CO3** Engage in review of scientific literature in the areas of biomedical sciences.
- CO4** Identify DNA structure and replication, transcription, translation for integrated and Interdisciplinary studies for application in core and allied field of research.
- CO5** Critique and professionally present primary literature articles in the general cell biology field.

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓		
CO3	✓	✓			✓	✓		
CO4	✓	✓	✓	✓	✓	✓		
CO5	✓	✓	✓	✓	✓	✓		
Number of Matches = 28 , Correlations : High								

Prepared by: Dr. S.U.Mohammed Riyaz

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBSKB104	Skill Enhancement Course	Professional Communication for Life Sciences	3	3
Course Objectives:				
The aim of the course is to:				
1. Cultivate a good reading habit among students by making them understand different words so that they become self-reliant and independent reader.				
2. Develop the art of writing and speaking through activities such as discussions, debates, role play and short films.				
3. Develop digital competence for effective professional communication.				
Unit I	Reading Comprehension		9 Hours	
Purpose of reading, types, speed, characteristics of good reader. Two subjects based reading text. Reading comprehension activities. Reading texts on advertisement and answering inferential questions. Skimming and scanning				
Unit II	Writing skills		9 Hours	
Writing a paragraph. Summary writing based on reading passages. Dialogue writing. Writing an argumentative/persuasive essay. Writing invitation, circular.				
Unit III	Listening Comprehension		9 Hours	
Listening and hearing. Types of listening. Characteristics of a good listener. Listening to two talks/lectures by specialist on selected subject specific topic and answering comprehension exercises (inferential questions). Listening to a product launch – sensitizing learners to the nuance of persuasive communication. Listening to interviews. Listening activities and task.				
Unit IV	Speaking skills		9 Hours	
Introducing self and others. Icebreaking session, Small group discussions (based on listening and reading passages). Debate – Just A Minute activities. Making and presentation through short films. Role play – activities.				
Unit V	Digital Competence		9 Hours	
Power Point Presentation. Creating blogs, flyer and brochures. Making poster – writing slogan/captions – activities. Short academic presentation using power point presentation. The Science blogosphere.				
Books for study:				
1. Communicative English.2020. TANSCHÉ				
2. English for life sciences. 2020. TANSCHÉ				
3.Percy, R. (2012). Teaching of English. Hyderabad: Neelkamal Publications Pvt. Ltd.				
Books for References:				
1.Kumari, A.V (2014). Methods of Teaching English. Guntur: New Era Publications.				
2. Dye, D. S. (2012) How to Write a Paragraph, Model Citizen Publications.				
3. Writing Effective Paragraphs, The McGraw-Hill Companies, 2013				

4. Robert, A. Day and Nancy. (2011). Scientific English – A guide for scientists and other professional. Oxford, England

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1 - Relate the concepts that may enable them to undertake further studies in life.

CO2 - Illustrate scientific contents error free which may fetch them opportunities in communicating scientific research as a science writer.

CO3 - Prepare themselves for opportunities in Healthcare sectors through active listening abilities.

CO4 - Use communication skills to persuasively deliver scientific contents in a professional way.

CO5 - Apply technology to create, design scientific contents and communicate it in professional manner.

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							PSO 8
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	
CO1	✓		✓		✓	✓		
CO2	✓		✓		✓	✓		✓
CO3	✓		✓		✓	✓		✓
CO4	✓		✓		✓	✓		✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches = 27 , Relationship:= High								

Prepared by: Dr. N. Shabeer Ahmed

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
	Discipline-Specific Core Practical	Practical - Cell and Molecular Biology	3	-
Course Objectives: The aim of the course is to: 1. Understand and equip themselves about Cell types of both plant and animal structure. 2. Understand mitotic cell division preparation; get knowledge about all kinds of cells. 3. Understand and apply the principles and techniques of molecular biology in basic research. 4. Understand the cellular components underlying meiotic cell division				
1.	Identification of plant, animal, fungi, algal and bacterial cell			
2.	Squash preparation of onion root tip for mitotic stages			
3.	Observation of Meiotic stages (Demo)			
4.	Observation of Karyotyping (Plant / animal)			
5.	Preparation of temporary whole mount (human cheek cells)			
6.	Preparation of permanent whole mount (algal sample)			
7.	Isolation of DNA from buccal cell			
Books for study: 1.Verma P.S. and Agarwal V.K. (2016) Cell Biology (Cytology, Biomolecules, Molecular Biology), S.Chand and Company Ltd. 2. S. Arumugam (2019), Cell and Molecular Biology, Saras Publication. 3. RinaMajumdar, Rama Sisodia (2018),Laboratory Manual of Cell Biology, Prestige Publishers				
Books for References: 1. Cooper G.M. (2019) The Cell – A Molecular Approach, 8th Edn. Sinauer Associates Inc., Oxford University Press p.813. 2. Alberts B., Johnson B., Lewis J., Morgan D., Raff M., Roberts K. and Walter P. (2015) Molecular biology of cell, 6th Edn. Garland Science, Taylor and Francis, p. 1465. 3. Mason K.A., Losos J.B. and Singer S.R. (2011) Raven and Johnson’s Biology. 9th Edn. McGraw Hill publications. p.1406. 4. Lodish, Molecular Cell Biology 8Th Edn 2016 Edition by, Freeman Macmillan				
Course Outcomes (COs) By the End the Course, the Students will be able to CO1 Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology. CO2 Acquire their fundamental knowledge of cell biology under cell division. CO3 Develop Cell and molecular biology laboratory skills necessary to produce reliable and valid results in addressing fundamental research questions CO4 Attain various laboratory technical skills in core and allied fields. CO5 Discuss about gene expression concept and mutation studies for developing a strong ethics and technical skills in research.				

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓			
CO3	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓		✓	✓		
CO5	✓	✓	✓	✓	✓	✓	✓	
	Number of Matches = 30				Correlations : High			

Prepared by: Dr. S.U.Mohammed Riyaz **Verified by:**Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

Semester I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBBTAL11	Other Elective Course	ALLIED FUNDAMENTALS OF BOTANY	5	5
Course Objectives: The aim of the course is to: 1. To study the characteristics and importance of plants. 2. To know the anatomy of plant structures. 3. To understand embryology of plants.				
Unit – I	ALGAE AND BRYOPHYTE		15 Hours	
General characteristics and economic importance of Algae: Structure, Reproduction and life cycle of following genera – Diatom, (Fresh water) Spirulina. General characteristics and Economic importance of Bryophytes : Structure, Reproduction of following genera – Sphagnum and Riccia				
Unit – II	PTERIDOPHYTE AND GYMNOSPERM		15 Hours	
General characteristics and economic importance of Pteridophytes : Structure, Reproduction and life cycle of following genera –Adiantum and Equisetum.General characteristics and economic importance of Gymnosperms : Structure, Reproduction of following genera – Pinus and Cycas.				
Unit – III	ANGIOSPERM AND PLANT TAXONOMY		15 Hours	
General outline of Bentham and Hooker’s system of classification. General characters and economic importance of Annonaceae, Rutaceae, Solanaceae, Euphorbiaceae and Poaceae.				
Unit – IV	PLANT ANATOMY		15 Hours	
Plant anatomy tissues – Simple and Complex. Primary Structure of Dicot Stem, Root and Leaf and Primary structure of Monocot Root and Leaf.				
Unit – V	EMBRYOLOGY		15 Hours	
Embryology structure of mature anther, pollen gran, development of male gametophyte, development of female gametophyte and fertilization.				
Books for Study: 1. Vasishta PC, Sinha AK and Kumar A, Botany for Degree Students (Volumes), 2nd Edition, Chand & Company Pvt Ltd, New Delhi, India, 2010. 2. Hait G, Bhattacharya K and Ghosh AK, A Text Book of Botany, 5th Edition, New Central Book Agency Pvt Ltd, Kolkata, India, 2011. 3. Sharma OP, Plants and Human Welfare, Prakathi Prakashan Publications Pvt Ltd, Meerut, India, 2015. 4. Pandey BP, Botany for Degree students, 2 nd Edition, Chand & Company Pvt. Ltd, New Delhi, India, 2010.				
Books for Reference: 1. Alexopoulos CJ, Mims CW and Blackwell M, Introductory Mycology, 4th Edition, Wiley Publishers, New Delhi, India, 2010. 2. Sharma, O. P. 2011. Text book of Algae. Tata McGraw Hill Publ. Comp. Ltd. New Delhi. 3. Cutter, E.G. (2009). Plant Anatomy Part-I: Cells and Tissues (2nd Edn.), Plant Anatomy Part-II: Experiments and Interpretations. Edward Arnold, London. 4. Bhojwani, S.S. and Bhatnagar, S.P. (2010). The Embryology of Angiosperms (4th Edition). Vikas Publishing House (P) Ltd., UBS Publisher’s Distributors, New Delhi.				

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1: Demonstrate the knowledge base in Algae.

CO2: Exhibit the clear and concise and development in economically valuable plants.

CO3: Explain the evolutionary relationship between Pteridophyte and Gymnosperm

CO4: Point out the economic importance of Algae, Fungi and Bryophytes

CO5: Know the various domain in their plant tissues.

**MAPPING WITH COURSE OUTCOMES (COs) and PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓
CO4	✓	✓			✓	✓	✓	✓
CO5	✓	✓	✓		✓			
Number of Matches = 32				Relationship:= Very high				

Prepared by: Dr. N.P.M. Mohamed Tariq Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

Semester I				
COURSE CODE	COURSE	COURSE TITLE	HRS/ WEEK	CREDIT
-	Other Elective Course	ALLIED PRACTICAL FUNDAMENTALS OF BOTANY	3	-
Course Objectives: The aim of the course is to: 1. Differentiate algal species. 2. Identify Fungal pathogens in crops. 3. Different organisms by morphological structure of plants.				
List of Practical's 1. Identify and observation of types of specimen: (i) Algae – diatoms and volvox. (ii) Fungi – infected leaf (identification) (iii) Bryophytes – locally available specimen (iv) Pteridophytes – Locally available specimen 2. Transverse Sections of the plant leaf in Gymnosperms – Cycas 3. Transverse Sections of the plant of Dicot stem 4. Transverse Sections of the plant of Dicot Root 5. Transverse Sections of the plant of Dicot Leaf 6. Transverse Sections of the plant of Monocot Root 7. Microscopical mounting of different types of pollen grains 8. T.S. of young and mature anther (<i>Datura metal</i>)				
References: 1. Cutler D.F. Ted Botha T. and Stevenson D.W. 2016. Plant Anatomy: An Applied Approach. John Wiley & Sons. 2. Clive K. 2016. Plant Anatomy, Morphology and Physiology. Syrawood Publishing House. 3. Pandey BP, Modern Practical Botany, 1st Edition (Reprinted), Chand & Company Pvt. Ltd, New Delhi, India, 2011. 4. Sharma OP, Practical Botany, 7th Edition, Pragati Prakashan Educational Publishers Pvt, Ltd, Meerut, India, 2014.				
Course Outcomes (COs) By the End the Course, the Students will be able to CO1 Observe the structure of microscopically structure of plant body CO2 Examine algal diversity and structure of morphology of algae and bryophytes CO3 Observe and Understand the Morphology and Anatomy parts of fungi CO4 Identify simple and complex tissues of dicot and monocot plants CO5 Apply their knowledge of dicot and monocot plants to selected examples of changes.				

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓	✓
CO5	✓	✓	✓		✓		✓	✓
Number of Matches = 35 Relationship:= very high								

Prepared by: Dr. N.P.M. Mohamed Tariq

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBBT2001	Discipline Specific Core Course	MICROBIOLOGY	6	6
Course Objectives: The aim of the course is to: 1. To expose the fundamentals and scope of microbiology. 2. To learn the structure, composition and nutrition in bacteria. 3. To gain knowledge on staining, sterilization and reproduction of microbe.				
Unit I	INTRODUCTION TO MICROBIOLOGY		18 Hours	
Introduction to microbiology and microbes, history & scope of microbiology, Spontaneous generation versus Biogenesis. Whittaker’s five kingdom concept of classification. Three kingdom classification				
Unit II	STRUCTURE OF PROKARYOTIC CELL		18 Hours	
Overview of prokaryotic cell (size, shape and arrangement of the cell); structure of bacterial cell wall; external and internal structure of cell wall; composition and differences between Gram positive and Gram-negative bacteria, archaebacteria and eubacteria. Plasmids.				
Unit III	GROWTH AND NUTRITION		18 Hours	
Nutritional requirements for bacteria and nutritional categories; Culture media: components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched media. bacterial growth curve, bacterial culture methods.				
Unit IV	STAINING AND STERILIZATION		18 Hours	

Principles of staining, simple staining, negative staining, differential staining, Gram and acid-fast staining, flagella staining, capsule and endospore staining. Sterilization – Physical and chemical.		
Unit V	VIRUS, FUNGI and ALGAE	18 Hours
General characteristics, classification and Life cycle of Virus (TMV), General characteristics, classification reproduction and economic importance of Fungi (Yeast). General characteristics, classification, reproduction and economic importance of Algae (Spirulina).		
Books for study:		
1. Pelczar, M. J., Reid, R. D., & Chan, E. C. (2001). Microbiology (5th ed.). New York: McGraw-Hill. 2. Willey, J.M., Sherwood, L., Woolverton, C.J., (2008). Prescott, Harley and Klein. Microbiology [7th Edition], McGraw-Hill Higher Education publications. 3. Matthai, W., Berg, C. Y., & Black, J. G. (2005). Microbiology, Principles and Explorations. Boston, MA: John Wiley & Sons. 4. Albert G Moat, John W. Foster, Micheal P. Spector. (2002). Microbial Physiology (4th Edition) John Wiley & Sons, Inc., Publication. 5. N. Arumugam, A. Thangamani, L.M. Narayanan. (2020). A Text Book of Microbiology. Saras Publication.		
Books for References:		
1. Ananthanarayanan and Jeyaram Paniker C.K. (2009). Text Book of Microbiology, 8th Edition, Orient Longman, Chennai. 2. Matthai, W., Berg, C. Y., & Black, J. G. (2005). Microbiology, Principles and Explorations. Boston, MA: John Wiley & Sons. 3. Willey, J. M., Sherwood, L., Woolverton, C. J., Prescott, L. M., & Willey, J. M. (2011). Prescott's Microbiology. New York: McGraw-Hill. 4. WulfCrueger and AnnelieseCrueger, (2000). "Biotechnology – A textbook of Industrial Microbiology", Panima Publishing Corporation, New Delhi. 5. Tortora, G.J., Funke, B.R. and Case, C.L. 2012. Microbiology - An Introduction. 11 th Edition. Pearson Education. 6. A.J. Salle. 1974. Fundamental Principles of Bacteriology. Tata McGraw – Hill Edition.		
Course Outcomes (COs) <i>By the End the Course, the Students will be able to</i> CO1: Understand the fundamentals and scope of microbiology. CO2: Distinguish the structure of gram positive and gram negative bacteria CO3: Acquire knowledge about formulation of medium and its prerequisites CO4: Have the capability to demonstrate the staining techniques. CO5 : Familiar with classification and structure of microbes.		

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (POs)

Course Outcomes (CO)	Programme Specific Outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓		✓	✓	✓		✓
CO2	✓		✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓

CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓			✓	✓	✓		
Number of matches: 33					Correlations: Very High			

Prepared by: Dr. M.L. Mohammed Kaleem Arshan

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
UBBTPR21	Discipline Specific Core Course	CELL & MOLECULAR BIOLOGY AND MICROBIOLOGY - PRACTICAL	3	3
Course Objectives: The aim of the course is to: 1. To learn the sterilization technique and preparation of media for bacteria. 2. To gain knowledge on simple and differential staining techniques. 3. To give basic idea on Serial dilution technique. 9. Sterilization techniques – Physical and Chemical 10. Preparation of media (Solid and Liquid). 11. Simple staining. 12. Differential staining – Gram's staining. 13. Staining of Fungi – LPCB. 14. Motility of bacteria by hanging drop method. 15. Enumeration of Bacteria- Serial dilution (Water) - Pour plate and Spread plate method. 16. Pure culture technique- Streak plate method.				
Books for study: 1. H. Abdul Jaffar Ali. (2018) Laboratory Manual on Microbiology. Vijay Nicole Imprints Private Limited. Chennai. 2. Cappuccino, J.H. and Sherman, N. (2014). Microbiology – A Lab Manual (10thed). Singapore: The Benjamin Publishing Company. 3. Reddy, C. A., Beveridge, T. J., Breznak, J. A., Marzluf, G. A., Schmidt, T. M., & Snyder L. R. (2007). Methods for General and Molecular Microbiology (3rded). Washington: American Society for Microbiology. 4. Gunasekaran, P. 2009. Laboratory Manual in Microbiology. 1st Edition. New Age International Publishers. Reprint 2009. 5. Arnold L. Demain & Julian E. Davies. 1999. Manual of Industrial Microbiology and Biotechnology. 2nd Edition. ASM press.				
Course Outcomes (COs) By the End the Course, the Students will be able to				

- CO1:** Understand the sterilization technique used in microbiology.
CO2: Acquire knowledge about formulation of medium and its prerequisites
CO3: Distinguish the gram positive and gram negative bacteria
CO4: Apply the knowledge of staining for fungi
CO5: Have the capability to enumerate bacteria by different culture techniques.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (COs)	Programme Specific Outcomes (POs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓			✓	✓	✓	✓	✓
CO3	✓	✓		✓	✓	✓	✓	✓
CO4	✓	✓		✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 36					Correlations: Very High			

Prepared by: Dr. M.L. Mohammed Kaleem Arshan

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBBTAL21	Other Elective Course	Allied II- ETHNOBOTANY	5	4
Course Objectives: The aim of the course is : 1. To know specific plant taxa used by people 2. To impart knowledge on plant systematics and its applications. 3. To familiarize the students with plants having immense economic importance.				
Unit 1	Introduction		15 Hours	
Ethnobotany: History - Concept – Scope and status. Life style of Tribal communities of Tamil Nadu state of Ethnobotany- kanikkars, kurumbas, irulas and badagas – Role of Ethno medicine and its scope in modern times.				
Unit 2	Methodology and studies		15 Hours	
Methods and techniques used in Ethnobotany a) Field activities for data collection – Documentation like Video recording, Photographs, Interview – methods, questionnaire and data sheet. b) Authentication of plant species - Herbarium c) Ancient Literature d) Role of sacred places in local areas of Thirupattur.				
Unit 3	Plants and Tribal medicine		15 Hours	
Significance of the following plants in ethno botanical practices (along with their habitat and morphology and their uses) a) Azadirachta indica b) Cassia auriculata c) Cissus quadrangularis d) Ocimum sanctum e) Rauvolfia serpentina f) Vitex negundo g) Withania somnifera.				
Unit 4	Drug evaluation		15 Hours	
Analytical pharmacognosy – Drug adulteration- Morphological evaluation - Microscopic evaluation- Chemical evaluation – Biological Evaluation – Quality control of Herbal drugs.				
Unit 5	Ethnobotany Drug		15 Hours	
Ethnobotany as a source of drug. a) Reserpine b) Artemisin c) Gugulipid d) Vinblastine e) Strychnine.				
Books for study (Text Books):				
1. Jain SK. Methods and approaches in Ethnobotany, Society of Ethnobotanists, Lucknow, 1989. 2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd edn. Agrobios, India. 3. Trivedi P C, 2006. Medicinal Plants: Ethnobotanical Approach, Agrobios, India 4. S.K. Jain, 1990. Contributions of Indian ethnobotany. Scientific publishers, Jodhpur				
Books for References:				
1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 2015. 2. Colton C.M. 2010. Ethnobotany – Principles and applications. John Wiley and sons – Chichester. 3. Rama Ro, N and A.N. Henry (2011). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah 4. Pal, D.C. & Jain, S.K., 2010. Tribal Medicine. NayaPrakash Publishers, Calcutta 5. Ashima S, An Introduction to Ethnobotany, 1st Edition, Omega Publication Pvt Ltd, New Delhi, India, 2017.				
Course Outcomes (COs)				
By the End the Course, the Students will be able to				
CO1: express the historical development of ethnobotany				

CO2: recognize the ethno botanically important plants species also experimenting data.
CO3: know and/or identify important plant species.
CO4: enlighten which parts of these plants are important modern and ethics for usage.
CO5: give information apply about their natural habitats and social values.

**MAPPING WITH COURSE OUTCOMES (COs) and PROGRAMME SPECIFIC
OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓
Number of Matches = 37, Relationship:= very high								

Prepared by:Dr. N.P.M. Mohamed Tariq

Verified by: Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBBTAP21	Other Elective Course	ALLIED PRACTICAL - FUNDAMENTALS OF BOTANY AND ETHNOBOTANY	3	4
Course Objectives: The aim of the course is: 1. To know specific plant taxa used by people 2. To impart knowledge on plant systematics and its applications. 3. To familiarize the students with plants having immense economic importance.				
List of Practical 1. Phytochemical Test – Alkaloids, Flavonoids, Terpenoids. 2. Field trip to survey, document on people-plant relationship 3. Herbarium – Collection, Processing and Preservation of specimens 4. Testing of Antimicrobial activity of herbal drug of by disc diffusion method. 5. Plant Identification, Morphology, Description – locally available plants 6. Demo – Paper chromatography of sugars in nectar (Chromatographic Techniques).				
Course Outcomes (COs) <i>By the End the Course, the Students will be able to</i> CO1: Express the historical development of ethnobotany CO2: Recognize the ethno botanically important plants species. CO3: Know and/or identify, concepts, entrepreneurs also environmental base. CO4: Enlighten which parts of these plants are important for usage. CO5: Give information about their natural habitats and cultivated lands.				

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓		✓	✓
CO4	✓	✓	✓		✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	
Number of Matches = 35, Relationship:= very high								

Prepared by: Dr. N.P.M. Mohamed Tariq

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

PSOs for M.Sc Biotechnology programme

Upon completion of the M.Sc Biotechnology programme, the students will be able to:

PSO 1: Evolve with recent innovations and scientific updates in various thrust areas of biotechnology in accordance with best scientific temperament, professional and research ethics throughout life.

PSO 2: Apply broad multidisciplinary knowledge and transferable skills in biotechnology and related subjects suitable for employment in the pharmaceutical and biotechnology industry, government research institutes or other agencies.

PSO3: Contribute to innovative thinking, scientific approach, and problem solving skills for various health, environment, cultural and social issues through scientific knowledge.

PSO 4: Recognize ethical issues in connection with recombinant DNA technology, gene cloning, animal manipulation, IPR, biosecurity and the management of sensitive experiments.

PSO 5: Discriminate data beautification and data manipulation / scientific misconduct.

PSO 6: Make use of ICT to carry out and deliver the research works and assignments independently and with team of students across disciplines.

PSO 7: Practice research & professional ethics as well as responsibility of SOPs.

PSO8: Evolve with recent innovations and scientific updates in the technological era in accordance with best scientific temperament, professional and research ethics throughout life.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES(M.Sc.) WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (PO)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	PSO1	√	√	√		√	√	√	√	√
	PSO2	√	√	√	√	√		√		
	PSO3	√	√	√	√	√	√	√		√
	PSO4	√	√		√		√		√	√
	PSO5	√		√	√	√	√		√	
	PSO6	√		√		√	√	√	√	
	PSO7			√	√			√		√
	PSO8	√	√			√		√		√
Number of matches = 54, Correlation : High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBT1001	Discipline Specific Core Course	MICROBIOLOGY AND MICROBIAL TECHNOLOGY	6	5
Course Objectives: The aim of the course is: 1. To update the knowledge on microbes. 2. To get familiar and develop skill of microbial technology 3. To equip the students to compete for job in clinical labs				
Unit I	INTRODUCTION TO MICROBIOLOGY		18 Hours	
History and scope of microbiology; identification of microorganisms on the basis of morphological, physiological, biochemical, immunological, and molecular characteristics; bacterial classification according to Bergey’s Manual of Systemic Bacteriology; relevance of microbiology to human life; microorganisms as model organisms.				
Unit II	CULTURE TECHNIQUES		18 Hours	
Theory and practice of sterilization, pure culture techniques; construction of culture media; enrichment of culture techniques, isolation and culture of aerobic and anaerobic bacteria; culture collection, preservation and maintenance of microbial cultures. Microbial growth: mathematical expression of growth, growth curve, measurement of growth and growth yields; synchronous growth; continuous culture; environmental factors affecting growth.				
Unit III	MICROBIAL GENETICS		18 Hours	
Plasmids and episomes; transformation (Griffith’s experiment, competent cells); conjugation (U-tube experiment; F+, XF mating; Hfr conjugation, F’ conjugation); transduction (generalized and specialized transduction); transposable elements in bacteria (IS elements).				
Unit IV	FOOD AND INDUSTRIAL MICROBIOLOGY		18 Hours	
Role of microbes in food production - Microbiology of fermented food and dairy products – cheese, yogurt, Alcoholic beverages-beer, wine. Food spoilage and Preservation processes. Microbes as source of food - single cell protein, Application of Microbes in industries production of antibiotics (penicillin), amino acids (Glutamic Acid) organic Acids (citric acid).				
Unit V	MEDICAL MICROBIOLOGY		18 Hours	
Pathogenesis, lab diagnosis, prevention and control of important microbial diseases, Bacterial diseases (Tuberculosis, Leprosy, Typhoid, Pneumonia, Cholerae) - Fungal diseases (Candidiasis, Aspergillosis, Coccidioidomycosis, Pneumocystis Pneumonia), Viral Diseases (HIV, Rabies, Hepatitis) and Protozoan diseases (Malaria, Cryptosporidiosis, Leishmaniasis).				
Books for study: 1. Pelzer, Chan and Kreig. 1986. Microbiology. 5th Edition. McGraw-Hill. 2.Prescott, Harley, Klein. 2003. Microbiology. 5th Edition. McGraw Hill Publication. 3. Bernard R. Glick, T.L. Delovitch, Cheryl L. Pattern, 2014.Medical Biotechnology, ASM Press.				

4. Powar and Dagainawala. 2010. General Microbiology. Volume – I. Himalaya Publishing House.
 5. Mansi EMTEL and Bryle CFA. 2007. Fermentation Microbiology and Biotechnology. 2nd Edition, Taylor & Francis Ltd, UK.

Books for References:

1. Tortora, G.J., Funke, B.R. and Case, C.L. 2012. Microbiology - An Introduction. 11th Edition. Pearson Education.
 2. Stainer, Ingharam, Wheelis and Painter. 1987. General Microbiology. 5th Edition. Macmillan Education, London.
 3. A.J. Salle. 1974. Fundamental Principles of Bacteriology. Tata McGraw – Hill Edition.
 4. R.W. Old and S.B. Primrose. 1985. Principles of gene manipulation. Blackwell Scientific Publications.
 5. Benjamin Lewin. 2006. Genes IX. 9th Edition. Jones and Bartlett publishers.
 6. Wolf. Cruzar and Annalise Cruzar. 2000. Biotechnology Text Book of Industrial Microbiology. Panima Publishing House, New Delhi.
 7. Patel, A.H. 2001. Industrial Microbiology, Mac-Millan India Ltd.
 8. Waites, M.J. et. al., Industrial Biotechnology: An Introduction, Blackwell publishing, UK, 2007.

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1: Outline the evolution, physiological and biochemical aspects of microbes.

CO2: Gain knowledge on microbial culture techniques.

CO3: Examine the importance of reproduction process in microbes.

CO4: Identify and understand industrially important bacteria.

CO5: Organize the knowledge of common infectious diseases

MAPPING WITH COURSE OUTCOME (CO) AND PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (COs)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓		
CO3		✓		✓		✓	✓	✓
CO4		✓	✓	✓		✓	✓	✓
CO5		✓	✓	✓				✓
Number of matches = 28					Correlations: High			

Prepared by: Dr. M.L. Mohammed Kaleem Arshan

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBT1002	DSC2	FUNCTIONAL BIOCHEMISTRY	6	5
Course Objectives:				
The aim of the course is:				
1. To elucidate the regulatory mechanism of water, electrolytes, acid and base in the body and imbalances in their metabolism.				
2. To describe the process of energy generation through the metabolism of biomolecules.				
3. To explicate the different phase of digestion and oxidation of lipids and proteins				
Unit I	Water, Electrolyte, Acid & Base – Balance and imbalance		18 Hours	
Distribution of body water and Electrolytes – Normal water, electrolyte balance – Regulatory mechanism, Acid- Base balance – Acid produced by the body- mechanism of regulation of pH – Different buffer System, Acid – Base regulation- Role of respiration and renal mechanism, Acid Base imbalance – Acidosis and Alkalosis – metabolic respiratory.				
Unit II	Carbohydrate metabolism		18 Hours	
Absorption of carbohydrates. Utilization of glucose in the body – Embden – Mayerhof pathway – phases of glycolysis –Energy yield – regulation of glycolysis. Formation and fate of pyruvic acid. Krebs Cycle – reaction – regulation of TCA cycle. Energy yield – hexose monophosphate (HMP) shunt – metabolic pathway – glycogenolysis - gluconeogenesis.				
Unit III	Lipid metabolism		18 Hours	
Digestion of Lipids – Phases of digestion – absorption of lipids – Glycerol, Fatty acid, Cholesterol, phospholipids. Oxidation of Fatty acids - β - oxidation - steps – bioenergetics. Biosynthesis of cholesterol, regulation of Cholesterol synthesis by HMG – COA reductase.				
Unit IV	Protein metabolism		18 Hours	
Digestion of Protein in stomach, duodenum and small intestine. Absorption of amino acids. Dissimilation of amino acids – Transamination, deamination, trans deamination and Urea formation – Glucose – alanine Cycle.				
Unit V	Nucleic acid metabolism		18 Hours	
Digestion and absorption of Nucleic acid – Biosynthesis of purine ribonucleotides – Salvage pathway - regulation of purine nucleotide biosynthesis – Biosynthesis of pyrimidine ribonucleotides, Regulation of pyrimidine biosynthesis. Degradation of purine and pyrimidine nucleotides.				
Books for study:				
1. RK. Murray, et al., Harper’s Illustrated Biochemistry –, 31 st Edition, McGrawHill, 2018				
2. U Satyanarayan and U Chakrapani, Biochemistry –5 th edition, Books and Allied (P), Ltd.				
3. DM. Vasudevan, S. Sreekumari, Textbook of Biochemistry for Medical Students –, 9 th edition, Jaypee Brothers Medical Publishers (P) Ltd, 2019				
Books for References:				
1. MN Chatterjea, RanaShinde, Textbook of Medical Biochemistry –, 8 th edition, Jaypee Brothers Medical Publishers (P) Ltd, 2012.				

2. D. Voet, J.G Voet, Biochemistry, 4th edition, John Wiley & Sons, 2011.
3. D. Voet, J.G Voet, C.W, Fundamentals of Biochemistry -. Pratt, 5th edition, Wiley, 2016.
4. D.L. Nelson and M.M. Cox, Lehninger Principles of Biochemistry –, 7th Illustrated edition, Macmillan Worth Publishers, 2017.

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1 - Conclude the state of a healthy living system from abnormal ones

CO2 - Use the concepts to investigate the defects in carbohydrate metabolism through focus on the coordinated mechanism.

CO3 - Correlate the relationship of lipid metabolism with the metabolic pathway of other macromolecules.

CO4 - Compare the normal mechanism of amino acid catabolism with the defective ones.

CO5 - Illustrate synthesis and catabolism of nucleic acids.

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓		✓		✓
CO2	✓	✓	✓	✓		✓		✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓		✓
CO5	✓	✓	✓	✓		✓		✓
Number of Matches = 32					Relationship: Very High			

Prepared by: Dr. N. Shabeer Ahmed

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	Mapping	1-29%	30-59%	60-69%	70-100%
Matches	Matches	1-10	11-25	26-30	31-40
Correlation	Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTPR11	Discipline Specific Core Practical	PRACTICAL - MICROBIOLOGY AND MICROBIAL TECHNOLOGY	6	4
Course Objectives: The aim of the course is: - To acquire skills in handling the microbes. - To perform the various experiments with microbes. - To get insight into the microbial techniques and preservation of bacteria.				
Experiments” - Pure culture isolation and maintenance of organisms from soil and water by plating, streaking. - Growth curve measurement of bacterial population by turbidometry methods. - Microscopic examination of bacteria by Gram stain. - Isolation of fungi from soil sample. - Analysis of water for portability and determination of MPN. - Assay of antibiotics production. - Biochemical tests to identify various organisms - IMVIC test and TSI. - Antibiotics sensitivity test- Disk diffusion-Kirby Bauer method.				
Books for study: - Cappuccino, J.H. and Sherman, N. (2014). Microbiology – A Lab Manual (10th ed). Singapore: The Benjamin Publishing Company. - Reddy, C. A., Beveridge, T. J., Breznak, J. A., Marzluf, G. A., Schmidt, T. M., & Snyder L. R. (2007). Methods for General and Molecular Microbiology (3rd ed). Washington: American Society for Microbiology. - Gunasekaran, P. (1995). Laboratory Manual in Microbiology. New Delhi: New Age International (P) Ltd. Publishers. - Gunasekaran, P. 2009. Laboratory Manual in Microbiology. 1st Edition. New Age International Publishers. Reprint 2009. - Dr. T. Sundararaj. Microbiology Laboratory Manual. Dr.A.L. MPGIBMS, University of Madras, Taramani, Chennai – 600 113.				
Course Outcomes (COs) By the End the Course, the Students will be able to CO1: Isolate and maintain of bacteria. CO2: Acquire knowledge about growth of bacteria. CO3: Distinguish the gram positive and gram negative bacteria CO4: Apply the knowledge of biochemical reaction to discriminate the bacteria CO5: Have the knowledge on testing of pathogenicity.				

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (COs)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓				✓	✓	✓
CO2	✓	✓				✓	✓	✓
CO3		✓	✓			✓	✓	✓
CO4		✓	✓			✓	✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓
Number of matches = 27					Correlations: High			

Prepared by: Dr. M.L. Mohammed Kaleem Arshan

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTPR12	Discipline Specific Core Practical	PRACTICAL – FUNCTIONAL BIOCHEMISTRY	6	4
Course Objectives: The aim of the course is: 1. To develop skills in accuracy and Precision of analysis 2. To train them in preparing buffers of known pH. 3. To quantitatively estimate the concentration of biomolecules.				
1. Preparation of buffers –Phosphate of different pH, TAE, TE buffer at different concentrations. 2. Beer Lambert law verification. 3. Estimation of carbohydrate by Anthrone method. 4. Estimation of reducing sugar – DNS method. 5. Isolation of casein from milk. 6. Determination of protein by Bradford method. 7. Determination of DNA by Diphenylamine method. 8. Estimation of RNA by Orcinol method.				
Books for study: 1. L. Mukherjee Medical Laboratory Technology –. Vol. I, II, III, 3rd Edition, Tata McGraw Hill Publishing Company Limited, 2017. 2. S. K. Sawhney, 2009. Introductory Practical Biochemistry. Narosa Publishers, India 3. Nigam, 2007. Lab Manual Of Biochemistry. Tata McGraw-Hill Edition, USA.				
Books for References: 1. H. Varley Practical Clinical Biochemistry –, 5th edition, WH Medical Books Ltd, 2002. 2. Ochei J and Kolhatkar A, Medical Laboratory Science theory and practice –3rd edition, Tata McGraw-Hill Education, 2002. 3. J. Jayaraman, Laboratory Manual in Biochemistry –Wiley Eastern Limited, 1981. 4. David Plummer, Practical Biochemistry –Tata McGraw-Hill Edition, 2008.				
Course Outcomes (COs) <i>By the End the Course, the Students will be able to</i> CO1 - Relate how essential biochemical principles and reactions are employed in living system. CO2 - Apply skills developed, in areas of workplace such as, research institutes and industries. CO3 - Define different metabolic concepts, relating them to solve clinical complications. CO4 - Recapitulate the understanding of biomolecules and apply them in biotechnology industry. CO5 - Modify methods to analyze biological macromolecules and developed rational drug evaluating methodology.				

**MAPPING WITH COURSE OUTCOME (COs) AND PROGRAMME
SPECIFIC OUTCOMES (PSOs)**

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓			✓	✓
CO2	✓	✓	✓	✓	✓		✓	✓
CO3	✓	✓	✓	✓			✓	✓
CO4	✓	✓	✓	✓		✓	✓	✓
CO5	✓	✓	✓	✓		✓	✓	✓
Number of Matches = 33					Relationship: Very High			

Prepared by: Dr. N. Shabeer Ahmed

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE11	Discipline Specific Elective Course	HUMAN PHYSIOLOGY	6	4
Course Objectives: The aim of the course is: - To understand the introduction and importance of general physiology. - To understand the anatomical structures and the physiological functions of body systems. - To understand and demonstrate the interrelations of the organ systems to each other. - To understand the respiratory, digestive, cardiovascular and muscle physiology, of neurophysiology, reproductive and sense organs.				
Unit I	GENERAL PHYSIOLOGY, BLOOD AND BODY FLUIDS		15 Hours	
Blood, blood volume, Blood corpuscles, Hemopoiesis and formed elements, plasma function, blood groups and Rh typing, Blood transfusion, Hemoglobin, immunity, Hemostasis Lymph and Lymphatic system, CSF, Synovial fluid, Amniotic fluid.				
Unit II	RESPIRATORY AND DIGESTIVE SYESTEM		15 Hours	
Physiological anatomy of respiratory tract. Comparison of respiration in different species, anatomical transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration. Anatomy of GI tract, Digestion and absorption of carbohydrates, protein, fat, energy balance, BMR.				
Unit III	CARDIOVASCULAR AND MUSCLE PHYSIOLOGY		20 Hours	
Comparative anatomy of heart structure, myogenic heart, ECG – its principle and significance, cardiac cycle, Pace maker, heart as a pump, blood pressure, neural and chemical regulation of all above, Pace maker. Classification of muscles. Muscle – types and their mechanism of action.				
Unit IV	REPRODUCTIVE AND EXCRETORY SYSTEM		20 Hours	
Reproductive organ - Hormonal regulation of testicular and ovarian function. Spermatogenesis and Oogenesis. Puberty, pregnancy and lactation. Contraceptive methods. Physiology of excretion, kidney, urine formation, urine concentration, waste elimination, Diuretics, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance.				
Unit V	NERVOUS SYSTEMAND SENSE ORGANS		20 Hours	
Introduction to nervous system. Neurons, action potential, gross neuro-anatomy of the brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture. Nerve impulse, conduction of nerve impulse, synapse, synaptic transmission, neuro macular junction, reflex action. Physiology of vision: Structure of eye, image formation and defects of the eye, Receptor mechanism of the eye, photo pigments, Visual cycle. Sense organs – structure of ear, defect of hearing and tactile response.				
Books for study:				
- C.C.Chatterjee ,Human Physiology 11th Coloured Edition (Volume I and Volume II) by 1 December 2017. - Dee UnglaubSilverthorn, Human Physiology: An Integrated Approach 5th Edition by 2010. - Guyton &Hall,Text Book of Medical physiology –2015.				

9. N. Arumugam, Human Physiology – Dr., Saras publications.
10. William. F. Ganong, Review of Medical Physiology, 25th Edition (Lange Medical Book) Paperback – 16 November 2015

Books for References:

7. Barbara Janson Cohen, Jasan J Taylor, Memmler's, Human Body in health and Diseases, 10th edition, Lippincott Williams&Wilkins publications.
8. William. F. Ganong, Review of Medical Physiology McGraw-Hill Medical; 22 edition 2005.
9. Guyton MD, Arthur C, Human Physiology & Mechanism of Disease 6th edition.
10. Widmaler, E.P, Raff.H, Strang, K.T, Vander's Human Physiology 11th edition, McGraw Hill International Publications 2008.
11. Human Physiology 7th edition Fox, S.I. McGraw Hill Publications 2002.
12. K. Saradhasubramanyam, A Hand Book of Basic Human physiology- S. Chand & Co., Ltd.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1: Understand the structure and function of various systems in human body.

CO2: Acquire knowledge on nervous and muscular system in human which gives a clear picture about respective disorder.

CO3: Compare anatomy and physiology of reproductive system, liver and metabolism of xenobiotics in humans etc.

CO4: Analyze hormones involved in disorders associated with them and treatments in both genders respectively.

CO5: Relate the anatomy and physiology of different human body systems and its implications in various industries.

MAPPING WITH COURSE OUTCOME (CO) AND PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (COs)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	√	√	√			√		√
CO2	√	√	√	√				√
CO3	√	√	√			√		√
CO4	√	√		√		√		√
CO5	√	√	√		√	√	√	√
Number of matches = 26 Correlations: High								

Prepared by: K. MuhammedShariq

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE12	Discipline Specific Elective Course	STEM CELL TECNOLOGY	6	4
Course Objectives: The aim of the course is: 1.To impart basic understanding of stems cells and its types 2. To get knowledge in the development of embryonic stem cells 3. To learn the techniques of creating adult stem cells. 4. To outline the manipulation of stem cells for drug development 5. To have knowledge about the application of stem cells in medicine and health.				
Unit I	STEM CELL BASICS		18 - Hours	
Stem Cells sources - Unique properties of stem cells – embryonic stem cells - adult stem cells – umbilical cord stem cells – similarities and differences between embryonic and adult stem cells. Properties of stem cells – pluripotency and totipotency.				
Unit II	EMBRYONIC STEMCELLS		18 - Hours	
<i>In vitro</i> fertilization –culturing of embryos-isolation of human embryonic stem cells – blastocyst – inner cell mass –growing ES cells in lab – laboratory tests to identify ES cells – stimulation ES cells for differentiation – properties of ES cells. Applications of Embryonic stem cells.				
Unit III	ADULT STEM CELLS		18 - Hours	
Somatic stem cells – test for identification of adult stem cells – adult stem cell differentiation – trans differentiation –plasticity – different types of adult stem cells-liver stem cells-skeletal muscle stem cells-bone marrow derived stem cells.				
UnitIV	STEM CELL IN DRUG DISCOVERY AND TISSUE ENGINEERING		18 - Hours	
Target identification – Manipulating differentiation pathways – stem cell therapy vs cell protection - stem cell in cellular assays for screening – stem cell based drug discovery, drug screening and toxicology - tissue engineering application – production of complete organ - kidney – eyes - heart – brain.				
Unit 5	GENETIC ENGINEERING AND THERAPEUTIC APPLICATION OF STEM CELLS		18 - Hours	
Gene therapy – genetically engineered stem cells – stem cells and Animal cloning – transgenic animals and stem cells. Therapeutic applications – Parkinson disease - Neurological disorder – limb amputation – heart disease - spinal cord injuries – diabetes –burns - HLA typing- Alzheimer’s disease.				
Books for study):				
5. Potten.C S, “ <i>Stem Cells</i> ,” Elsevier, 1996. 6. <i>Embryonic Stem cells</i> by Kursad and Turksen. 2002. Humana Press. 7. <i>Stem cell and future of regenerative medicine</i> . By committee on the Biological and Biomedical				

applications of Stem cell Research.2002.National Academic press.
8. Robert Lanza, “ <i>Essentials of Stem Cell Biology</i> ,” Academic Press, 2009.
Books for References:
4. Peter Quesenberry, “ <i>Stem cell biology and Gene Therapy</i> ,” Wiley-Liss, 1998.
5. Daniel R. Marshak, “ <i>Stem cell biology</i> ,” Cold Spring Harbor Laboratory Press, 2001.
6. AriffBongso, EngHin Lee, “ <i>Stem Cells: From Bench to Bedside</i> ,” World Scientific, 2011.
Course Outcomes (COs)
By the end of the course, the students will be able to:
1. Illustrate the implications of the functioning of genes in stem cells.
2. Describe basic concepts in stem cell biology, including origin and plasticity.
3. Differentiate between embryonic and adult stem cells, and describe their characteristics.
4. Analyze the applications of stem cell genetics including for tissue engineering and in vitro directed differentiation purposes.
5. Discuss potential therapeutic applications of stem cells.

MAPPING WITH COURSE OUTCOME (CO) AND PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (COs)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	√		√	√		√		√
CO2	√	√	√	√		√		√
CO3	√	√				√		√
CO4	√	√	√	√	√	√	√	√
CO5	√	√	√			√		√
Number of matches = 29					Correlations: High			

Prepared by: Mr. A. AmjadHussain

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTDE13	Discipline Specific Elective Course	VIROLOGY	6	4
Course Objectives: The aim of the course is: 3. To understand the basic concepts of viral structure, classification, gene expression and transmission. 4. To get insight on to the plant, animal and human virus and its significance.				
Unit I	Introduction to General Virology			18 Hours
General Virology: brief outline on discovery of viruses, Nomenclature and classification, distinctive properties of viruses, morphology and ultra-structure, viroid, Types of Virus, <i>In silico</i> analysis - virus sequence and retrieval.				
Unit II	Viral replication and Genetics			18 Hours
Virus infection and replication in a host cell: recognition of the host cell, strategies of genomic replication and gene expression in DNA and RNA viruses, control of viral replication, virus assembly, release from the host cell and maturation, genetic variation of viruses.				
Unit III	Human Virology			18 Hours
General strategies, replication of plus stranded RNA virus, negative strand RNA viruses (VSV and Influenza) Other RNA Viruses Replication of double stranded RNA virus (Rota), ambisense RNA (LCM) and retroviruses (HIV). DNA viruses Replication of double stranded DNA viruses (SV40), ssDNA Virus (AAV) Viral Cancers Role of papilloma HIV, Epstein Barr virus, HTLV and herpes in pathogenesis of cancers, diagnosis, prevention				
Unit IV	Plant Virology			18 Hours
History of plant viruses, composition and structure of viruses. Plant Virus nomenclature and classification, genome organization, replication and movement of viruses. Symptomatology of important plant viral diseases, transmission, chemical and physical properties, host virus interaction, plant virus vector relationship.				
Unit V	Animal Virology			18 Hours
History and scope of Veterinary Virology, Viruses and their properties, Structure of capsid, symmetry, viral envelopes, Virion structure and functional relationship. DNA VIRUSES : Poxviridae, Herpesviridae, Adenoviridae, Papillomaviridae, Circoviridae: Flaviviridae, Rhabdoviridae, Coronaviridae, Prions example symptoms and treatment				
Books for study:				
1.P.Saravanan, Virology, 2017 MJP Publishers 2.Dr Brian W J Mahy and Dr Marc H Van Regenmortel, Encyclopedia of virology third edition, 3.Edward K. Wagner, Basic Virology Third Edition				
Books for References:				
1. John B. Carter, Virology Principles & Application 2. Roger Hull John Innes, Plant Virology, CentreNorwich, UK 3.Kayser, Medical Microbiology, 2005				
Course Outcomes (COs) By the End the Course, the Students will be able to CO1: Students will learn to differentiate between types of viruses and their role in disease. CO2: Describe and will learn about replication and genetic variation of viruses CO3: Explain the rationale behind the classification system of viruses and present example viruses for each group and diagnosis, prevention of viral diseases on human				

CO4: Explain Plant Virus nomenclature and classification, important plant viral diseases, and its properties

CO5: Describe virion structure and functional relationship on animal virus, symptoms and treatment with example of viral families.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (CO)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓		✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches = 36					Correlation : Very High			

Prepared by: Mr. S. Zakirullah

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBT2001	Discipline Specific Core Course	r - DNA Technology	5	5
Course Objectives: The aim of the course is: 1. To familiarize the students to versatile tools and techniques employed in r-DNA technology. 2. To enable students to know vector types, host genotype specificities and enzymes. 3. To make them comprehend Gene Recombination and Gene transfer methods. 4. To make the student understand Hybridization, DNA sequencing and strategies for the production of recombinant proteins.				
Unit I	Introduction to r-DNA technology			15 Hours
History, scope and recent developments in r-DNA Technology - Concept and basic steps in r-DNA technology - Isolation of Gene of interest – Quantification of nucleic acids. Amplification Using PCR- Restriction Digestion - DNA purification - Ligation of DNA Molecules – Bacterial Transformation –Screening of recombinants- alpha complementation- Blue – white selection. Ethics in r-DNA technology.				
Unit II	Host and Vectors			15 Hours
Host: Prokaryotic host and Eukaryotic host. Vectors: Bacteriophage vectors - Lambda and M13 virus-based vectors- cosmid- phagmids. Yeast vectors. Expression vectors- vectors facilitating protein purification, Shuttle vectors. Artificial chromosomes-BAC-YAC- HAC.				
Unit III	Enzymes in Genetic Engineering			15 Hours
Restriction Endonucleases: Types of restriction Endonucleases, classification and uses. Restriction mapping.DNA modifying enzymes: DNA polymerases - DNA polymerase I- thermostable DNA polymerases used in PCR- T4/T7 DNA Polynucleotide kinases - terminal deoxynucleotidyltransferase -alkaline phosphatases - RNA polymerases- ligases- nucleases - DNase I- SI Nuclease–deoxyribonuclease - RNAases- Exo III - Klenow fragment -reverse transcriptase.				
Unit IV	Gene Recombination and Gene transfer methods			15 Hours
Construction of genomic and c-DNA libraries, Joining of DNA Fragments to vectors, Homo polymer tailing, cohesive and blunt end ligation, adaptors, linkers. Bacterial Conjugation, Transformation, Transduction, Episomes, Plasmids, Microinjection, Electroporation, Microprojectile, Shot Gun method, Ultrasonication, Liposome fusion, Microlaser.				
Unit V	Hybridization and DNA sequencing			15 Hours
Principle of hybridization. Northern blotting, Southern blotting, Western blotting. Polymerase chain reaction, Restriction fragments length polymorphism, RAPD, AFLP, MAP.DNA sequencing: Maxam-Gilbert (Chemical) and Sanger- Nicolson (dideoxy/ enzymatic) sequencing method, Pyrosequencing. Automated DNA sequencing. Primer designing. Strategies for the production of recombinant proteins - insulin- human growth hormone- industrially important proteins.				
Books for study: 1. Satyanarayana. U, 2008. Biotechnology, Books and Allied (P) Ltd. 2. Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7th edition. Blackwell Publishing, Oxford, U.K. 3. H.K. Das, Text Book of Biotechnology (2004). Wiley Publications.				
Books for References: 1. Click G.R. and Pasternak J.J. (2010). Molecular Biotechnology 4th Edition, Panima publications. 2. Brown TA. (2006). Gene Cloning and DNA Analysis. 5th edition. Blackwell Publishing				

Oxford, U.K.

3. Sambrook J, Fritsch EF and Maniatis T. (2001). *Molecular Cloning-A Laboratory Manual*. 3rd edition. Cold Spring Harbor Laboratory Press.

4. Watson, J.D. Gilman, M. Witowski J. and Mark Zoller (1992). *Recombinant DNA*. Scientific American Books.

5. Winnacker, E.L. (1987). *From Genes to Clones: Introduction to gene technology*

Course Outcomes (COs)

By the end the Course, the Students will be able to

CO1 - Have a technical knowledge on recombinant genes and its production.

CO2 - Have knowledge to construct recombinant DNA and use them for cloning.

CO3 - Be competent in PCR, Restriction Digestion, Ligation and related molecular methods.

CO4 - Be proficient in conducting and interpreting genetic engineering experiments using various types of vectors and hosts.

CO5 - Have knowledge to know about genetic engineering products and its human applications.

MAPPING WITH COURSE OUTCOME (COs) AND PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO 1	✓	✓	✓	✓		✓	✓	✓
CO 2	✓	✓	✓	✓		✓		✓
CO 3	✓	✓	✓	✓		✓		✓
CO 4	✓	✓	✓	✓	✓	✓		✓
CO 5	✓	✓	✓	✓		✓		✓
Number of Matches = 32					Relationship = Very High			

Prepared by: Dr. M.A. Farook

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBT2002	Discipline Specific Core Course	IMMUNOLOGY AND IMMUNOTECHNOLOGY	6	5
Course Objectives: The aim of the course is: 4. To get insight into the Immune system and its significance 5. To understand various basic and advanced techniques involved in immunology. 6. To get familiar in the role of immune system in human disease management.				
Unit I	INTRODUCTION & ORGANIZATION OF IMMUNE SYSTEM		18 Hours	
Introduction to immunology: Symbols, organs of immune system- Lymphoid organs. Immunity types – Innate and acquired immunity, Cells of immunity – NK cells, LAK, Macrophages, Neutrophils and Eosinophils. Determinants of innate immunity. Acquired immunity – humoral and cell mediated immunity, development and mechanism. Hematopoiesis.				
Unit II	ANTIGEN & ANTIBODIES		18 Hours	
Antigens: Definition, criteria for antigenicity, Epitope, Paratope, Haptens. Classification of antigen based on Chemical nature, mode of action, and antigenic determinant. Antibodies: Basic Structure, Classes, Subclasses of Immunoglobins, biological functions, Monoclonal antibodies - Production and applications. Tumour antigens, immune prophylaxis and immune therapy- Vaccines and their types.				
Unit III	COMPLEMENT SYSTEM& HYPERSENSITIVITY		18 Hours	
Complement: Definition, components, activation, pathways of activation – classical complement pathway and Alternative complement pathway. HLA/MHC complex, Hypersensitivity – definition, Classification based on coombs and gel, Types of hypersensitivity – type I, II, III, IV, V and their mechanisms.				
Unit IV	TRANSPLANTATION IMMUNOLOGY& IMMUNE DISEASES		18 Hours	
Transplantation of Immunology – Immunology of Graft Rejection, Methods of Graft Rejection – Tissue and Organ Transplantation and its Ethics– Immunosuppressive agents – Immunology of Tolerance. Immunology of Tumors –Tumor Antigens, AutoImmune Diseases, Immunodeficiency Diseases.				
Unit V	IMMUNOTECHNOLOGY		18 Hours	
Techniques based on antigen- antibody reactions and their applications - Agglutination test and its type, Precipitation, Complement fixation test, immuno assays using labelled reagents immunofluorescence, ELISA, RIA, RAST and RIST, western blotting. Commonly used immunological tests – ASO, WIDAL, VDRL, RPR, and TPHA.				
Books for study: 4. Kuby J, Cameron J, Todd C, Mitchell J, Immunology, W.H. Freeman and Co., 2000. 5. Elgert KD, Immunology: Understanding Immune system, John Wiley and Sons, 1996. 6. CV Rao, Immunology – A text book, Narosa Publications, 2011.				
Books for References: 6. Ivan M.Rohit (1994). Essential Immunology – Blackwell Scientific Publications 7. Oxford Kuby J (1997) Immunology –WH Freeman and Company, New york. 8. Richard M hyde (1995), Immunology III edition. National Medical Series, Williams and Wilkins. Harward Publishing Company.				

9. <https://www.sciencedirect.com/book/9780128098196/immunology>
 10. Primer to the Immune Response, 2014, (2ND Edition), Tak W. Mak, Mary, E. Saunders and Bradley D. Jett. Elsevier Inc., Amsterdam.

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1 Get familiarity of Immune system and its attributes

CO2 Get the significance of cellular coordination in the generation of immune responses.

CO3 Insight into the roles of molecules of the major histocompatibility complex and their Function and role of hypersensitivity mechanism in immune system.

CO4 Crucial role of transplantation immunology techniques and its ethics with respect to immune disorder

CO5 Acquire technical and transferable skills in Importance of Immunotechniques.

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches = 36, Correlations : Very High								

Prepared by: Dr. S. U. Mohammed Riyaz

Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTPR21	Discipline Specific Core Practical	Practical - r DNA Technology	6	4
Course Objectives: The aim of the course is: 1. To provide skill about isolation technique and molecular experiments. 2. To provide an opportunity to experimentally verify the PCR and AGE. 3. To inculcate practical skill on tools and techniques employed in r-DNA technology. 4. To make the student understand about SDS – PAGE and Bacterial Transformation.				
1. Isolation of plasmid DNA 2. Isolation of RNA 3. Amplification of DNA using PCR 4. Restriction digestion 5. Quantitation of DNA by various methods. 6. Ligation 7. Bacterial Transformation 8. SDS – PAGE				
Books for study: 1. Brown TA. (2006). <i>Gene Cloning and DNA Analysis</i>. 5th edition. Blackwell Publishing, Oxford, U.K. 2. Primrose SB and Twyman RM. (2006). <i>Principles of Gene Manipulation and Genomics</i>, 7th edition. Blackwell Publishing, Oxford, U.K. 3. Sambrook J, Fritsch EF and Maniatis T. (2001). <i>Molecular Cloning-A Laboratory Manual</i>. 3rd edition. Cold Spring Harbor Laboratory Press. 4. Judith W. Zyskind and Sanford I. Bernstein. (1989). <i>Recombinant DNA Laboratory Manual</i>. Academic Press.				
Books for References: 1. Satyanarayana. U, 2008. <i>Biotechnology, Books and Allied (P) Ltd.</i> 2. Primrose SB and Twyman RM. (2006). <i>Principles of Gene Manipulation and Genomics</i>, 7th edition. Blackwell Publishing, Oxford, U.K. 3. By H.K. Das, <i>Text Book of Biotechnology</i> (2004). Wiley Publications. 4. Click G.R. and Pasternak J.J. (2010). <i>Molecular Biotechnology</i> 4th Edition, Panima publications. 5. Watson, J.D. Gilman, M. Witowski J. and Mark Zoller (1992). <i>Recombinant DNA</i>. Scientific American Books. 6. Winnacker, E.L. (1987). <i>From Genes to Clones: Introduction to gene technology</i>				
Course Outcomes (COs) By the end the Course, the Students will be able to CO 1 - Isolate plasmid DNA and Quantify the concentration for DNA for cloning purpose. CO 2 - Apply techniques like PCR for identification of genes and separate the DNA by AGE. CO 3 - Apply techniques like Ligation and Transformation for bacterial cloning. CO 4 - Apply techniques like SDS PAGE for identification of Protein. CO 5 - Compatible in use of vectors and hosts.				

MAPPING WITH COURSE OUTCOME (COs) and PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO 1	✓	✓	✓	✓		✓	✓	✓
CO 2	✓	✓	✓	✓		✓	✓	✓
CO 3	✓	✓	✓	✓		✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓		✓	✓	✓
Number of Matches = 36					Relationship = Very High			

Prepared by: Dr. M.A. Farook

Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTPR22	Discipline Specific Core Practical	Practical - Immunology and Immunotechnology	5	4
Course Objectives: The aim of the course is to: 1. Understand and apply the principles and techniques of immunology 2. Demonstrate the basic knowledge of immunological process like antigen preparation. 3. Learn about the immunological test of different pathological disease. 4. Understand the principles and significance of various immunological techniques and various diagnostic assays.				
1.	Antigen Preparation – Heat treatment			
2.	Antigen Preparation - Chemical treatment			
3.	WIDAL test			
4.	VDRL test			
5.	Single Radial Immuno diffusion test			
6.	Double Immuno diffusion test/Ouchterlony double immunodiffusion			
7.	ELISA			
Books for study: 1. Aruna Bhatia, Manual of Practical Immunology- Paramount Publication. 2. Debajit Borah, Biotechnology Lab Practicals- Global Vision Publishing House 2012. 3. Roitt I, Brostoff, Male, Immunology, Mosby Publications, 2001				
Books for References: 1. Leffel, Donnenberg, A and Rose, W. (1997) Hand book of human Immunology Boca Raton Fla: C.R.CPress. 2. Frank, C. Hay &Olwyn, M. R. Westwood (2002). Practical immunology. (4th ed.), London: Blackwell Scientific Publication.. 3. Rabindra Narian, Practical Immunology (2012).Wisdom Publisher. 4. Paul, Fundamental of immunology. 1999, 4th Edition, Lippcott Raven.				
Course Outcomes (COs) By the End the Course, the Students will be able to CO1 Prepare antigens by various methods. CO2 Demonstrate the diagnostic assays for particular immune diseases by advanced technologies. CO3 Perform and identify diseases like typhoid and vulnerable diseases by laboratory skills. CO4 Perform and Analysis sensitive experiments like immunodiffusion tests. CO5 Apply and procure employment in health care field by developing skills to do ELISA test.				

MAPPING WITH COURSE OUTCOME (COs) AND PROGRAMME SPECIFIC OUTCOMES (PSOs)

Course Outcomes (COs)	Programme Specific outcomes (PSOs)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓		✓
Number of Matches = 37					Correlations : Very High			

Prepared by: Dr. S.U.Mohammed Riyaz Verified by: Dr. H. Abdul Jaffar Ali

Note:

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Relationship	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE21	Discipline Specific Elective Course	BIO-ANALYTICAL TECHNIQUES	6	4
Course Objectives: The aim of the course is to: Illustrate the principle of instrumentation, and applications of the analytical tools of biochemistry like spectroscopy, electrophoresis, chromatography, radioisotopic techniques and centrifugation technique.				
Unit I	SPECTROSCOPY		15 Hours	
Laws of absorption and absorption spectrum. Principle, instrumentation and applications of UV-visible spectrophotometer, spectro-fluorimetry, Luminometry, Atomic absorption spectroscopy,Flame emission spectrophotometry and Circular dichroism spectroscopy. Basic principles of mass spectrometry, NMR, X-ray diffraction and their biological applications.Basics of laser techniques.				
Unit II	RADIOISOTOPE TECHNIQUES		15 Hours	
Nature and units of radioactivity. Types of radioactive decay, Detection and measurement of radioactivity- counter based on gas ionization, Geiger- Muller counter, solid and liquid scintillation counting. Autoradiography. Radioimmune assay. Applications of radioisotopes in biology- Radiation hazards & safety aspects.				
Unit III	ELECTROPHORESIS & BLOTTINGTECHNIQUES		15 Hours	
Electrophoresis: General principles. Electrophoresis of proteins- SDS-PAGE, native gels, isoelectric focusing, Cellulose acetate electrophoresis. Electrophoresis of nucleic acids- agarose gel electrophoresis, pulsed-field gel electrophoresis.Two-dimensional polyacrylamide gel electrophoresis. Blotting techniques: Southern, Northern and Western blotting techniques.				
Unit IV	CHROMATOGRAPHY		15 Hours	
Principle, Column chromatography, instrumentation and applications of thin layer chromatography, ion-exchange chromatography, Molecular exclusion chromatography and Affinity chromatography, gas liquid chromatography. Principle, instrumentation and applications –High performance liquid chromatography (HPLC), reverse phase chromatography (RPC).				
Unit V	CENTRIFUGATION &TISSUE FRACTIONATION		15 Hours	
Basic principles of sedimentation -calculation of centrifugal field, types of centrifuges, Types of rotors, preparative centrifugation, differential centrifugation, Density-gradient centrifugation. Subcellular fractionation by differential centrifugation. Analytical centrifugation, Applications of analytical ultracentrifugation. Care and maintenance of centrifuges. Cell disruption, homogenization and extraction of membrane bound proteins-cell disruption methods – organ and tissue slice techniques.				

Books for study:

4. Wilson and Walker, Practical Biochemistry by. 5th edition Cambridge Univ2005.
5. Shawney&Randhir Singh Introductory Practical Biochemistry (Narosa, 2000).
6. Dinesh Kumar Chatanta, Prahlad Singh Mehra, Instrumental methods of analysis in biotechnology. L.K. International publishing house. Pvt Ltd.

Books for References:

8. David Friefielder, W.H. Freeman, Physical Biochemistry 2nd edition(1982).
9. Mukherjee, Introduction to Medical Laboratory Techniques Volume I, II & III.
10. Robert D.Brown, Introduction to instrumental analysis Pharma Book Syndicate (2006).
11. Boyer, R. Modern Experimental Biochemistry. 3rd ed. Addison Wesley Longman, 2000.
12. Upadhyay, Upadhyay and Nath. Biophysical Chemistry Principles and Techniques. Himalaya Publ. 1997
13. Sambrook. Molecular Cloning. 2nd edition. Cold Spring Harbor Laboratory, 2001.
14. David Freifelder Physical Biochemistry – Applications to Biochemistry and Molecular Biology. WH Freeman & Co. 2nd edition 1999.

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1 - Differentiate the principle, instrumentation and applications spectroscopy.

CO2- Assess the radio isotopic techniques like gas ionization, Geiger- Muller counter, solid and liquid scintillation counting.

CO3 - Compare the different electrophoretic techniques with its applications.

CO4 - Compare the different chromatography techniques with its advantage and disadvantages.

CO5 - Choose the proper centrifugation techniques for separating and analyzing the subcellular organelles and biomolecules.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (CO)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	√	√	√			√		√
CO2	√	√		√		√	√	√
CO3	√	√	√			√		√
CO4	√	√	√		√	√	√	√
CO5	√	√			√	√	√	√
Number of Matches : 29					Relationship: High			

Prepared by: Dr. M.L. Arbab Sikandar Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBIDE22	Core based elective	PROTEOMICS AND GENOMICS	06	04
Course Objectives The aim of the course is to: 5. Teach the basic concepts in genome analysis. 6. Apply knowledge of genomics and proteomics in analytical studies. 7. Correlate between genome and proteome. 8. Relate procedure and techniques for drug designing.				
Unit 1	Proteomics		15 Hours	
Proteomics: Identifying proteins in complex mixtures: Protein profiling, quantitative 2D GE, multidimensional chromatography, quantitative mass spectrometry, MALDI – TOF, TOF analysis and analytical protein chips. Protein structure databanks- protein databank.				
Unit 2	Genome Structure		15 Hours	
Organisation and structure of genomes,Genome sizes- microbial and organelle genomes - Centromeres and telomeres, tandem repeats- dispersed repeats (transposons). Basic Sanger sequencing - automated sequencing- sequencing simple genomes - Sequencing large genomes - finalizing sequences – resequencing and Next generation sequencing (NGS).				
Unit 3	Microarray & genome database		15 Hours	
Microarray: DNA Micro array, Protein Micro array Transcriptomics, Applications and advantages of Micro arrays- DNA chips and SAGE technology- Organization of genome projects- human, plant, animal and microbial genome.Genome databases; Annotation of genome.				
Unit 4	Human Genome		15 Hours	
Human Genome: Important genes associated with each chromosomes - Mendelian and sex linked traits in human inheritance. Genetic diseases due to defects in autosomal and sex linked genes. Whole genome sequencing – Human Genome Project.				
Unit 5	Pharmacogenomics and New Drug Design		15 Hours	
Pharmacogenomics and New Drug Design: Need for developing new drugs: Procedure followed in drug design; Molecular modification of lead compounds; Prodrug and soft drugs; Physico-chemical parameters in drug design; QSAR. Applications of proteome analysis to drug development and toxicology, Phage antibodies as tools for proteomics.				
Books for study (Text Books):				
1. Necia Grant Cooper; (Ed.). The Human Genome Project; Deciphering the blueprint of heredity University Science books, CA, USA. (1994). 2. Gary Zweiger. Transducing the Genome; Information, Anarchy and Revolution in Biomedical Sciences. Tata McGraw-Hill Publishers, New Delhi. (2003). 3. Branden, C and J.Troze. Introduction to Protein Structure. Second Edition. Garland Publishing, New Delhi. (1999). 4. Evans W.E. and Relling, M.V. Pharmacogenomics: translating functional genomics into rational therapeutics. Science 286:487. (1999). 5. Principles of Genome analysis and Genomics, 3 rd Edition, By S. B. Primrose and R. L.				

Twyman, Blackwell publishing (2003).

6. S. B. Primrose and R.M. Twyman - Principles of Genome Analysis and Genomics, 7 th Edition, Blackwell Publishing, 2006.

Books for References:

1. Baxeavanis, A.D and Ouellette, B.F.F. Eds. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. Wiley Interscience. New York. (2001).

2. Higgins, D and Taylor, W (Eds). Bioinformatics: Sequence, Structure and Databnks. Oxford University Press, Oxford. (2000).

3. Principles and Practices of Plant Genomics (Volume 3), By ChittaranjanKole and Albert G. Abbott. CRC Press (2017).

4. Genome Analysis: Current Procedures and Applications by Maria S. Poptsova. Caister Academic Press (2014).

Course Outcomes (COs)

By the end of the course, the students will be able to:

CO1: Define human genome database and sequences.

CO2: Apply proteomics approaches for protein sequencing and analysis.

CO3: Analyze the structural and functional genomics approaches for functional characterization of genes.

CO4: Design the experiments using different techniques of genome sequencing.

CO5: Apply the knowledge of pharmacogenomics for drug design.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (CO)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	√	√	√	√		√		√
CO2	√	√	√			√		√
CO3	√	√	√			√		√
CO4	√	√	√	√	√	√	√	√
CO5	√	√	√			√		√
Number of Matches : 29					Relationship: High			

Prepared by: Mr. K. MuhammedShariq Verified by: Dr. H. Abdul Jaffar Ali

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS. / WEEK	CREDIT
PBBTDE23	DSE2	CANCER BIOLOGY	6	4
Course Objectives: The aim of the course is to: 1. To learn the various types of cancer and its detection method. 2. To understand the carcinogens and its effect. 3. To get knowledge regarding the role of molecular tools in the treatment of cancer. 4. To have knowledge about the treatment of cancer with advanced methodology.				
Unit I	Fundamentals of Cancer Biology			18 Hours
Introduction to Cancer- History of Cancer- Causes of Cancer - different forms of cancer – detection of Cancer, early screening method – detection using biochemical assay – Tools for detection of cancer – Tumor markers – molecular tools for early diagnosis of cancer – Hereditary cancers.				
Unit II	Carcinogenesis			18 Hours
Carcinogenesis definition – stages and types of carcinogenesis- carcinogen and its effect – theory of carcinogenesis - Physical & Chemical carcinogens and its effect, major classes of chemical carcinogens - mechanism of various types of radiation carcinogenesis – mutagens and mutation.				
Unit III	Molecular Biology for Cancer			18 Hours
Role of molecular biology in the treatment of cancer – Discovery of oncogenes, types of oncogenes – detection & identification of oncogenes - Role & mechanism of oncogenes activation - Molecular tools for identification of cancer genes - Tumor suppressor genes, Role of Telomerases in cancer, single nucleotide polymorphism (SNP) in cancer.				
Unit IV	Principle of Cancer Metastasis			18 Hours
Metastasis definition- Stages and Mechanism of metastasis - Angiogenesis, Role of angiogenesis in cancer, Invasion- classification and significance of metastasis - Protease and tumor cell invasion – basement membrane, development & progression of carcinomas.				
Unit V	Cancer Therapy			18 Hours
Clinical diagnosis of cancer – different forms of therapy - chemotherapy, History and advantages - Radiotherapy – gene therapy, types and risks of gene therapy – advancement in the treatment of cancer - signals target towards cancer therapy, Advanced treatment of cancer - CRISPR, artificial intelligence, nanotechnology and telehealth.				
Books for study:				
1.Xlibris, Cancer Biology, a Study of Cancer Pathogenesis.Publisher: November 23rd, 2011 Pages: 152 2.Pradeep Kumar, The Textbook of Cancer Biology, Paperback,Publisher: Prachi Digital. 2022 3.Pearson Lewis J Kleinsmith, Principles of Cancer Biology.1st Edition				
Books for References:				
1. Raymond W. Ruddon – Michigan, Cancer Biology – Fourth edition – 2. Edwin Wang, Cancer System Biology – CRC Press -UK 3. HeskethRobin,Introduction to Cancer Biology, Cambridge University Press, February 2013 4. Pearson, Cancer Biology – Third Edition, Education (US) - 2006-05-11				

Course Outcomes (COs)***By the End the Course, the Students will be able to***

CO1 – Understand the various types of Cancer and carcinogens.

CO2 – Learn the various molecular tools used in the treatment of cancer.

CO3 – Understand the major significance of cancer and its effect.

CO4 – Understand the major significance of cancer and its effect.

CO5 – Know about the different types of therapy used for the treatment of Cancer.

MAPPING WITH COURSE OUTCOME (CO) and PROGRAMME SPECIFIC OUTCOMES (PSO)

Course Outcomes (CO)	Programme Specific outcomes (PSO)							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	✓	✓	✓	✓				✓
CO2	✓	✓		✓				✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓						✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓
Number of Matches : 28				Relationship: High				

Prepared by: M. Mohammed Zeeshan**Verified by: Dr. H. Abdul Jaffar Ali**

Mapping	1-29%	30-59%	60-69%	70-100%
Matches	1-10	11-25	26-30	31-40
Correlation	Poor	Moderate	High	Very High

**DEPARTMENT OF COMPUTER
SCIENCE UG SYLLABI FOR
DATA SCIENCE, B.C.A, B.Sc.
COMPUTER SCIENCE**

PROGRAMME OUTCOMES (POs) for B.C.A

By the end of the programme, the students will be able to

PO1	Communicate in English, the ideas, findings, and results effectively through conversations, meetings, and reports, especially through digital means. Develop linguistic skills in one Indian/Regional language
PO2	Demonstrate knowledge of the concepts, principles, theories, and techniques of the domain and allied subject areas.
PO3	Synergise knowledge with Analytical & Experimental skills to systematically, create & run programs/carry out experiments/formulate & prove theories to enrich the body of knowledge
PO4	Synthesize learned knowledge and acquired skills to Identify and critically analyze pertinent problems in the relevant discipline using appropriate tools and techniques.
PO5	Exhibit potential to accomplish tasks independently or as a member or leader of a team
PO6	Utilize specialized instruments and equipment, Computers, Software, Internet, and other ICT tools to carry out experiments
PO7	Demonstrate knowledge and scientific understanding to design experiments, use appropriate methodologies, analyze and interpret data and provide solutions, and Exhibit organizational skills, and the ability to manage time and resources.
PO8	Create Compounds/Products/Software or Design experiments and/or collaborate to help Society in building a Sustainable Environment
PO9	Discover a passion for Lifelong Learning through MOOCs, ODL, and Self - Learning techniques through optimum use of ICT
PO10	Identify and assess various issues in Environment and suggest measures to overcome them. Exhibit Ethics and Values in professional, Social, and Personal spheres of life, caring for the underprivileged, leading to a better sustainable future

PROGRAMME SPECIFIC OUTCOMES (PSOs) for B.C.A

By the end of the programme, the students will be able to

PSO1	Computational Ability: Implementing fundamentals of computing, computing specialization and domain knowledge suitable for job placement.
PSO2	Problem Analysis: Identify, formulate and analyze complex real-life problems in terms of mathematical modeling and computer science .
PSO3	Design /Development of solutions: Design algorithms for complex, real-world problems through computing systems, components or processes .
PSO4	Investigate Problems: Ability to analyze and investigate complex computing problems through design of experiments, analysis and interpretation of data.
PSO5	Exploration: Ability to explore the stored data to bring out valuable information.
PSO6	Professional ethics: Ability to perform professional practices in an ethical way, keeping in the mind cyber regulations & laws.
PSO7	Self learning: Ability to engage in independent learning for continuous self-development as a computing professional.
PSO8	Communication : Ability to effectively communicate with technical community
PSO 9	Individual and Team work: Ability to work in hierarchical team both as a member and leader.
PSO 10	Innovation and entrepreneurship: Ability to apply innovative ideas to become a entrepreneur.

MAPPING OF PROGRAMME SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	✓	✓			✓	✓	✓			
PSO2	✓		✓	✓	✓		✓			
PSO3	✓	✓	✓	✓			✓			
PSO4	✓	✓	✓	✓			✓	✓		
PSO5	✓				✓	✓	✓	✓	✓	
PSO6	✓	✓	✓	✓	✓		✓	✓		✓
PSO7	✓				✓	✓	✓	✓	✓	
PSO8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSO9	✓				✓			✓	✓	
PSO10	✓				✓	✓	✓	✓		✓
Number of matches = 61, Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-24	25-50	51-56	57-80
Correlation	Poor	Moderate	High	Very High

SYLLABI COMMON TO B.Sc. COMPUTER SCIENCE, B.C.A AND
B.Sc. DATA SCIENCE

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/WEEK	CREDIT
UBCC1001	DSC1	DIGITAL LOGIC FUNDAMENTALS & MICROPROCESSORS	4	4
Course Objectives				
To impart knowledge of 1. Number systems, logic fundamentals and circuits 2. Organization of computers and its architecture 3. Programming, interfacing and rudiments of system design of microprocessors.				
Unit-I	Digital Systems and Binary Numbers			10 Hours
Digital Systems – Binary Numbers – Number –Base Conversions -Octal and Hexadecimal Numbers – Complements of Numbers – Signed Binary Numbers – Binary Codes – Binary Storage and Registers – Binary Logic.(Chapter 1: sections : 1.1 to 1.9)				
Unit-II	Boolean algebra and Gate-Level Minimization			10 Hours
Basic Definitions –Axiomatic Definition of Boolean Algebra – Basic Theorems and Properties of Boolean Algebra – Boolean Functions – Canonical and Standard Forms– Digital Logic Gates – Integrated Circuits -The Map Method – Four-Variable K-Map – Five-Variable K-Map –Product-of-Sums Simplification – Don’t-Care Conditions. (Chapter 2: Sections: 2.2 to 2.6, 2.8, 2.9, Chapter 3: Sections: 3.2 to 3.6)				
Unit-III	Combinational Logic			10 Hours
Combinational Circuits – Analysis Procedure – Design Procedure – Binary Adder- Subtractor - Decimal Adder - Decoders– Encoders (Chapter 4: Sections: 4.2 to 4.6, 4.9 & 4.10)				
Unit-IV	Synchronous Sequential Logic			15 Hours
Sequential Circuits -Storage Elements: Latches, Flip-Flops - Register and Counters: Register – Shift Registers – Ripple Counters – Synchronous Counters. (Chapter 5: Sections: 5.2 to 5.4				
Unit-V	Microprocessor and Architecture(8085)			15 Hours
Microprocessor - Organization of Microprocessorbased system- Microprocessor Instruction set and Computer languages- Microprocessor Architecture and is operations- Memory classification- Memory mapped I/O and I/O mapped I/O- Pin diagram and Internal Architecture of 8085. (Text Book 2 Chapter 1: Sections: 1.1, 1.2 Chapter 3: Sections: 3.1, 3.2.7, 3.3 Chapter 4: Sections: 4.1 to 4.1.5)				

Books for study:

1. Digital Design with an Introduction to the Verilog HDL, M. Morris Mano & Michael D. Ciletti, 5th Edition, Person Education, 2013. (FOR Units I to IV).
2. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar, Penram International Publishing (India) Pvt. Ltd. 6th Ed. 2013 (for Unit V).

Books for Reference:

1. Morris Mano M, Kime .R.Charles, ||Logic And Computer Design Fundamentals|| (2nd Edition Updated).
2. Morris Mano M – —Computer System Architecture – PHI Third Edition.
3. Assembly Language Programming the IBM PC, Alan R. Miller, SubexInc,.

E-Resources:**Methodology of Teaching:**

Chalk and Talk, ICT Presentation, Video lectures, Assignments

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions	K2,K5
CO2	Acquire knowledge about various logic gates and logic families and analyze basic circuits of these families.	K2,K3
CO3	Design various combinational and sequential circuits such as encoders , decoders and counters using multiplexers, and flip - flops	K6
CO4	Describe and compare various memory systems, shift registers and analog to digital and digital to analog conversion circuits	K3
CO5	Acquire knowledge of Microprocessors and their architecture	K2,K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	✓	✓	✓	✓				✓	✓	
CO2	✓	✓	✓	✓	✓		✓	✓	✓	
CO3	✓	✓	✓	✓	✓				✓	
CO4	✓	✓	✓	✓	✓				✓	
CO5		✓	✓			✓	✓	✓		
Number of matches = 31, Correlation: Very High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCCAL11	OEC 1	Computer Oriented Statistical Methods 1	6	5
Course Objectives				
1. To familiar and to develop learning mindsets to analyze statistical data through Computational methods 2. To train students with essential tools for statistical analyses 3. To learn scientific view to conduct the survey in proper way to collect the data about specific perspective.				
Unit-I	Standard Deviation and Other Measures of Dispersion			15 Hours
Dispersion, or Variation, The Range, The Mean Deviation, The Semi- Interquartile Range, The 10–90 Percentile Range, The Standard Deviation, The Variance, Short Methods for Computing the Standard Deviation, Properties of the Standard Deviation, Charlie’s Check, Sheppard’s Correction for Variance, Empirical Relations Between Measures of Dispersion, Absolute and Relative Dispersion; Coefficient of Variation, Standardized Variable; Standard Scores, Software and Measures of Dispersion.				
Unit-II	Moments, Skewness, and Kurtosis			15 Hours
Moments , Moments for Grouped Data ,Relations Between Moments , Computation of Moments for Grouped Data, Charlie’s Check and Sheppard’s Corrections, Moments in Dimensionless Form, Skewness, Kurtosis, Population Moments, Skewness, and Kurtosis, Software Computation of Skewness and Kurtosis.				
Unit-III	Elementary Probability Theory			15 Hours
Definitions of Probability, Conditional Probability; Independent and Dependent Events, Mutually Exclusive Events, Probability Distributions, Mathematical Expectation, Relation Between Population, Sample Mean, and Variance, Combinatorial Analysis, Combinations, Stirling’s Approximation to n!, Relation of Probability to Point Set Theory, Euler or Venn Diagrams and Probability.				
Unit-IV	Distribution			15 Hours
Binomial,Poisson,Normal				
Unit-V	Correlation Theory			15 Hours

Correlation and Regression, Linear Correlation, Measures of Correlation, The Least-Squares Regression Lines, Standard Error of Estimate, Explained and Unexplained Variation, Coefficient of Correlation, Remarks Concerning the Correlation Coefficient, Product-Moment Formula for the Linear Correlation Coefficient, Short Computational Formulas, Regression Lines and the Linear Correlation Coefficient, Correlation of Time Series, Correlation of Attributes, Sampling Theory of Correlation, Sampling Theory of Regression.

Books for study:

Fundamentals of Mathematical Statistics by V.K.Kapoor and S.C.Kupta, Sultan Chand Publications , 11th ed, 2011

Books for Reference:

Mathematical Statistics by J.N. Kapur And H.C. Saxena 12th Ed, S.Chand Publications, 2016

E-Resources: <https://www.coursera.org/learn/statistics-for-data-science-python>

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Organize, manage and present data.	K1
CO2	Calculate and interpret the correlation between two variables.	K1,K2
CO3	Analyze statistical data using measures of central tendency, dispersion and location.	K4
CO4	Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions.	K3
CO5	Identify the type of statistical situation to which different distributions can be applied.	K6,K2
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO 9	PSO 10
CO1	✓	✓		✓		✓		✓		✓
CO2	✓		✓		✓		✓		✓	
CO3	✓	✓		✓		✓		✓		✓
CO4	✓		✓		✓		✓		✓	
CO5	✓	✓		✓		✓		✓		✓
Number of matches = 28, Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
		Computer Oriented Statistical Methods 1 Lab	2	0
Course Objectives				
1. To familiar and to develop learning mindsets to analyze statistical data through Computational methods 2. To train students with essential tools for statistical analyses 3. To learn scientific view to conduct the survey in proper way to collect the data about specific perspective.				
1. Graphical Representation of data 2. Measures of Central tendency 3. Measures of Dispersion 4. Moments, Skewness and Kurtosis 5. Correlation and Regression 6. Binomial , Poisson and Normal Distribution				
Books for study: Department Lab Manual				
Books for Reference: J.N. Kapur And H.C. Saxena S.Chand Publications 12 th Ed 2016				
E-Resources: https://www.coursera.org/learn/statistics-for-data-science-python				

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Demonstration

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Organize, manage and present data.	K1
CO2	Calculate and interpret the correlation between two variables.	K1,K2
CO3	Analyze statistical data using measures of central tendency, dispersion and location.	K4
CO4	Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions.	K3
CO5	Identify the type of statistical situation to which different distributions can be applied.	K6,K2
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO 9	PSO 10
CO1	✓	✓		✓		✓		✓		✓
CO2	✓		✓		✓		✓		✓	
CO3	✓	✓		✓		✓		✓		✓
CO4	✓		✓		✓		✓		✓	
CO5	✓	✓		✓		✓		✓		✓
Number of matches = 28, Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCC2001	DSC 3	PROGRAMMING IN C & Algorithms	7	6
Course Objectives				
1. To impart knowledge of logic forming to problems. 2. To impart knowledge of procedure oriented languages. 3. To impart knowledge of pointer. 4. To impart knowledge of file management. 5. To impart knowledge of Efficiency of Algorithms				
Unit-I	C Fundamentals and Control constructs			15 Hours
Structure of C Program- Tokens – Character Set - Keywords – Identifiers – Basic Data types - Variables – Constants – Input and Output Statements – Operators - Type Conversion and Type Casting.- Decision Control and Looping Statements				
Unit-II	Arrays and Functions			15 Hours
Declaration of Arrays – Accessing the Elements of an Array – Passing Array to Functions – Multidimensional Arrays Function Declaration/Function Prototype – Function Definition – Function Call – Return Statement – Passing Parameters to Functions – Storage Classes – Recursive Functions				
Unit-III	Pointers, Structure and Union			15 Hours
Declaring Pointer Variables – Pointer Expression and Pointer Arithmetic – Passing Arguments to Functions using Pointers – Pointers and Array – Array of Pointers – Dynamic Memory Allocation – Structure Introduction – Nested Structures – Structures and Functions – Unions				
Unit-IV	File operations			15 Hours
Using Files – Read & Write Files – Copy files –File Error Handling –File operations				
Unit-V	Efficiency of Algorithms			15 Hours
Divising and validating algorithms-Specification of algorithms- Analysing Algorithms- Asymtotic Notations- Time complexity- Space complexity-Recurrence relations.				
Books for study: 1. ReemaThareja, “Programming in C”, 2 nd Edition , 2015, Oxford Publishers 2. Computer Algorithms - ELLIS HOROWITZ - SARTAJ SAHNI - SANGUTHEVAR RAJASEKARAN ,2012, Computer Science Press				
Books for Reference:				
E-Resources:				

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Design and develop of modular programming.	K1,K2
CO2	Acquire knowledge decision making and looping concepts.	K2
CO3	Explore usage of Arrays, strings, structures and files.	K4
CO4	Effective utilization of pointers and preprocessor directives.	K5,K6
CO5	Estimate time and space complexity of algorithms	K4,K5
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	✓	✓	✓	✓	✓		✓	✓	✓	
CO2	✓	✓	✓	✓						
CO3	✓	✓	✓	✓						
CO4	✓	✓	✓	✓		✓				
CO5	✓	✓	✓	✓		✓				
Number of matches = 26, Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCCPR21	DSC4	Programming in C Lab	2	2
Course Objectives				
1. To impart knowledge of logic forming to problems. 2. To impart knowledge of arranging and searching elements 3. To impart knowledge of pointer. 4. To impart knowledge of file management.				
Unit-I	Control Constructs and Arrays			15 Hours
1. Generate Fibonacci numbers and check if each number is prime or not. 2. Checking a number as Armstrong, Perfect and Adam 3. Sin, and Cos series 4. Sum digits a number and check it as palindrome . 5. Compute in an array of numbers its sum , average , biggest and smallest . 6. Sort an array . 7. Search for a value using linear and binary search technique. 8. Add , subtract and multiply two matrices of order mXn.				
Unit-II	Functions and Strings			15 Hours
1. Compute factorial of a given number. 2. To check a String as palindrome. 3. Compute factorial, Fibonacci, and GCD using recursion. 4. Count the number of vowels, consonants and words in a given text. 5. Compare two strings without using library string function.				
Unit-III	Structure			15 Hours
1. Process student marks in an examination using Structure. 2. Process salary of an employee using Structure. 3. Add two complex numbers using Structure.				
Unit-IV	Pointers			15 Hours
1. Sum of elements an integer array using Pointers 2. Determine the length of a given string and reverse it using Pointers. 3. Compares two integer arrays as identical using pointers. 4. Process exam marks of a set of students using structure pointers.				
Unit-V	File Concepts			15 Hours
1. Separate Odd and Even numbers in a files. 2. Prepare Electricity Bill using File concepts. 3. Prepare students marks sheet using File concepts. 4. Prepare salary bill of employees of a company using File concepts.				
Books for study:				
1. ReemaThareja, “Programming in C”, 2 nd Edition , 2015, Oxford Publisher				
Books for Reference:Department Lab Manual				
E-Resources				

Methodology of Teaching: Demonstrate programs, ICT Presentation, logic discussion

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Implement modular programming	K3
CO2	Utilize control constructs effectively	K1,K2
CO3	Gain better knowledge of contiguous memory locations	K2
CO4	Address memory locations and usage	K3,K6
CO5	Store data permanently and retrieve them	K2,K6
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	✓	✓	✓	✓	✓		✓	✓	✓	
CO2	✓	✓	✓	✓						
CO3	✓	✓	✓	✓						
CO4	✓	✓	✓	✓		✓				
CO5	✓	✓	✓	✓		✓				
Number of matches = 26, Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBCCAL21	OEC2	Computer Oriented Statistical Methods 2	6	6
Course Objectives				
1.To familiar and analyze statistical data through Computational methods				
2.To train students with essential tools for statistical analyses				
3.To learn scientific view to conduct the survey in proper way and to collect the data .				
Unit-I	Statistical Decision Theory:			15 Hours
Statistical Decisions, Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Tests Involving Normal Distributions, Two-Tailed and One-Tailed Tests, Special Tests, Operating-Characteristic Curves; the Power of a Test, p-Values for Hypotheses Tests, Control Charts, Tests Involving Sample Differences, Tests Involving Binomial Distributions.				
Unit-II	Small Sampling Theory &Chi-Square Test:			15 Hours
Small Samples, Student's t Distribution, Confidence Intervals, Tests of Hypotheses and Significance, The Chi- Square Distribution, Confidence Intervals for Sigma , Degrees of Freedom,TheF Distribution. Observed and Theoretical Frequencies, Definition of chi-square, Significance Tests, The Chi-Square Test for Goodness of Fit, Contingency Tables, Yates' Correction for Continuity, Simple Formulas for Computing chi-square, Coefficient of Contingency, Correlation of Attributes, Additive Property of chi-square.				
Unit-III	Analysis of Variance			15 Hours
F-test, Analysis of Variance, Time series Analysis				
Unit-IV	Curve Fitting and the Method of Least Squares:			15 Hours
Relationship Between Variables, Curve Fitting, Equations of Approximating Curves, Freehand Method of Curve Fitting, The Straight Line, The Method of Least Squares, The Least-Squares Line, Nonlinear Relationships, The Least-Squares Parabola, Regression, Applications to Time Series, Problems Involving More Than Two Variables.				
Unit-V	Statistical Estimation Theory:			15 Hours
Estimation of Parameters, Unbiased Estimates, Efficient Estimates, Point Estimates and Interval Estimates; Their Reliability, Confidence-Interval Estimates of Population Parameters, Probable Error.				
Books for study: Fundamental Of Mathematical Statistics by S.C. Gupta And V.K. Kapoor, 11 th Edition, 2011, Sultan Chand Publishers				
Books for Reference: Mathematical Statistics by J.N. Kapur And H.C. Saxena, 12 th Ed, 2005, S.Chand Publishers				
E-Resources: https://www.coursera.org/learn/statistics-for-data-science-python				

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Assignments

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Know the practical issues arising in sampling studies.	K1,K2
CO2	Acquire knowledge on vital statistics, Index numbers and calculate an indices from given data.	K1,K3
CO3	Appropriately interpret results of analysis of variance tests.	K4
CO4	Demonstrate understanding of the concepts of time series and its applications in different areas.	K5,K6
CO5	Evaluate the properties of estimators.	K3
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)								PSO 9	PSO 10
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	✓	✓		✓		✓		✓		✓
CO2	✓		✓		✓		✓		✓	
CO3	✓	✓		✓		✓		✓		✓
CO4	✓		✓		✓		✓		✓	
CO5	✓	✓		✓		✓		✓		✓
Number of matches = 28 , Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER II				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/WEEK	CREDIT
UBCCAP21	OEC3	Computer Oriented Statistical Methods 2 Lab	2	0
Course Objectives				
1. To familiar and to develop learning mindsets to analyze statistical data through Computational methods 2. To train students with essential tools for statistical analyses 3. To learn scientific view to conduct the survey in proper way to collect the data about specific perspective.				
1. Test of Significance 2. Analysis of Variance(One way and Two way classification) 3. Sampling Methods 4. Binomial and Normal Distribution 5. F-Test 6. Test for hypothesis and significance 7. Curve fitting				
Books for study: Department Lab Manual				
Books for Reference: J.N. Kapur And H.C. Saxena S.Chand Publications 12 th Ed 2016				
E-Resources: https://www.coursera.org/learn/statistics-for-data-science-python				

Methodology of Teaching:

Chalk and Talk, ICT Presentation, Video lectures, Demonstration

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Know the practical issues arising in sampling studies.	K1,K2
CO2	Acquire knowledge on vital statistics, Index numbers and calculate an indices from given data.	K1,K3
CO3	Appropriately interpret results of analysis of variance tests.	K4
CO4	Demonstrate understanding of the concepts of time series and its applications in different areas.	K5,K6
CO5	Evaluate the properties of estimators.	K3
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)								PSO 9	PSO 10
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	✓	✓		✓		✓		✓		✓
CO2	✓		✓		✓		✓		✓	
CO3	✓	✓		✓		✓		✓		✓
CO4	✓		✓		✓		✓		✓	
CO5	✓	✓		✓		✓		✓		✓
Number of matches = 28 , Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

SEMESTER I				
COURSE CODE	CATEGORY	COURSE TITLE	HRS/ WEEK	CREDIT
UBDS1001	DSC 1	PROBLEM SOLVING AND ALGORITHMS	4	4
Course Objectives				
To impart knowledge of				
1. Designing algorithms for simple problems				
2. Arranging and searching for elements				
3. Text processing				
Unit-I	Algorithms for simple problems			15 Hours
Swap vales two variables- summing setoff numbers- factorial-Sine series-Fibonacci sequence-reversing digits of a number- Base conversion- character to number conversion- Factoring methods: Square roots of a number- smallest divisor of an integer- GCD of two numbers- Prime numbers- Prime factors of an integer-Generation of pseudo random numbers-Raising a number to a Large power- Nth Fibonacci number (Chapter 2 and 3)				
Unit-II	Array Techniques			15 Hours
Array Order Reversal – Array Counting or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array, Finding the K th Smallest element. (Chapter 4: Sections 4.1 to 4.6)				
Unit-III	Merging, Sorting & Searching			15 Hours
The Two Way Merge - Sorting by selection, exchange, insertion, Diminishing Increment, Partitioning- Binary Search - Hash Searching (Chapter 5: Sections 5.1, 5.5 to 5.8)				
Unit-IV	Text Processing & Pattern Searching			15 Hours
Text Line Length Adjustment – Left and Right Justification of Text – Keyword Searching in Text – Text Line Editing – Linear Pattern Search. (Chapter 6: Sections 6.1 to 6.5)				
Unit-V	Recursive Algorithms			15 Hours
Binary Tree Traversal – Recursive Quick Sort – Towers of Hanoi Problem – Sample Generations – Combination Generation – Permutation Generation. (Chapter 8)				
Books for study:				
How to Solve it by Computer ,R.G. Dromey , Pearson Edition, 2012				
Books for Reference:				
Programming c by Reema Thareja, Oxford Publishers , 2016				
E-Resources: https://www.atnyla.com/				

CO	COURSE OUTCOME	KNOWLEDGE LEVEL
CO1	Able to write algorithms for simple problems	K1,K2
CO2	Working mechanism of contiguous memory locations	K4
CO3	Organise elements in a desired way	K2,K4
CO4	Perform string operations	K3
CO5	Recursively apply a logic	K2,K3
KI- Remembering/Knowledge, K2- Understand, K3-Apply, K4-Analyse, K5 Evaluate, K6 - Create		

Course Outcomes (COs)	Programme Specific Outcomes (PSOs)									
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	✓	✓						✓		
CO2	✓	✓	✓	✓			✓			
CO3	✓	✓	✓	✓			✓			
CO4	✓	✓	✓	✓		✓	✓	✓		
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓
Number of matches = 29, Correlation: High										

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

Mapping Correlation Benchmark

Mapping	1-30%	31-60%	61-70%	71-100%
Matches	1-12	13-24	25-28	29-40
Correlation	Poor	Moderate	High	Very High

CERTIFICATE COURSE

**FIVE WEEK ONLINE CERTIFICATE COURSE IN
ENGLISH FOR BUDDING ENTREPRENEUR
CERTIFICATE COURSE CODE : UBENCC02**

PART 1- Course Learning Outcomes

6. Students will be able to identify the word related to business wealth.
7. Students can compare the way of business expression of past to the present market-changing scenario.
8. Students can use the idiomatic phrases that meant of business transaction.
9. Students can value the existing data through which it is communicated.
10. Students can write the business proposal with the suitable vocabulary.

PART-2

GUIDELINES

EVERYONE SHOULD PARTICIPATE
PRESENTING GOOD IDEAS ARE ALWAYS APPRECIATED
POSTING PICTURES CAN BE AVOIDED-
EMOTICONS ARE NOT MUCH APPRECIATED
LETS BE POLITE WITH OUR WORDS AND SENTENCES

PART-3

WEEK-1

TOPIC: INTRODUCTION- **About this Program**-(VIDEO)
VIDEO TRANSCRIPT
GRAMMAR- FROM THE VIDEO
READING-(PDF)- **Much to be learned from the Industry Authorities**
VIDEO- READ BY THE TEACHER
GRAMMR-FROM THE ARTICLE
ASSISNMENT-1
ASSIGNMENT-2
FIVE QUESTIONS

WEEK-2

TOPIC - **BUDDING ENTREPRENEUR** -(VIDEO)
VIDEO TRANSCRIPT
GRAMMAR- FROM THE VIDEO
READING-(PDF)- **PEARLS OF WISDOM**
<https://corporatecitizen.in/v7-Issue1/pearls-of-wisdom-building-beautiful-relationships.html>

VIDEO- READ BY THE TEACHER
GRAMMR-FROM THE ARTICLE
ASSISNMENT-1
ASSIGNMENT-2
FIVE QUESTIONS

WEEK-3

TOPIC - **BUDDING PSYCHOLOGY** -(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **WORK-LIFE BALANCE**

<https://corporatecitizen.in/v7-Issue3/work-life-balance-secret-is-to-use-the-right-strategy.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-4

TOPIC – **BUSINESS AND TECHNOLOGY** -(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **TRULY, MENTORING IS AN ART**

<https://corporatecitizen.in/v7-Issue5/the-last-word-truly-mentoring-is-an-art.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

WEEK-5,

TOPIC – **LISTENING TO THE CUSTOMERS**-(VIDEO)

VIDEO TRANSCRIPT

GRAMMAR- FROM THE VIDEO

READING-(PDF)- **FIRST THOUGHT**

<https://corporatecitizen.in/v7-Issue8/first-thought-rhythms-of-leadership.html>

VIDEO- READ BY THE TEACHER

GRAMMR-FROM THE ARTICLE

ASSISNMENT-1

ASSIGNMENT-2

FIVE QUESTIONS

CERTIFICATE COURSE				
COURSE CODE	COURSE	COURSE TITLE	HRS. / WEEK	CREDIT
UBBTCC02	CERTIFICATE COURSE	ORNAMENTAL FISH CULTURE	5	

Course Objectives

1. To develop entrepreneurial skills amongst the students.
2. To give knowledge about ornamental fish breeding, rearing and marketing.
3. To encourage and promote the science of keeping an aquarium.

Unit-I	Introduction to Aquaculture and Ornamental Fishes Trading	6 -- Hours
Basics of aquaculture - Definition and Scope. History of aquaculture: Present global and national scenario. World trade of ornamental fish and export potential.		
Unit-II	Introduction to Ornamental fishes	6 -- Hours
Introduction to Ornamental fishes - Different varieties of exotic and indigenous ornamental fishes.		
Unit-III	Fish Breeding and rearing of Live Bearers	6 -- Hours
Breeding of ornamental fish with reference to live bearer species - Guppies, Mollies, Sword tail fish and Platy fish. Rearing of live bearers. Disease control.		
Unit-IV	Fish Breeding and rearing of Egg layers	6 -- Hours
Breeding of ornamental fish with reference to selected egg layer species - Angel fish, Zebra fish, Gold fish, Siamese fighter and Neon tetra. Rearing of egg layers. Disease control.		
Unit-V	Construction of aquarium	6 -- Hours
Construction, settings and maintenance of aquarium - Construction of ornamental fish unit - Benefits of an Aquarium. Budget for setting up of an aquarium.		
Books for Study: 1. Stephen Spotte. Marine Aquarium Keeping. A Wiley-Interscience Publication. 2. Guy N. Smith. Profitable Fish Keeping. 3. Tekrival K.L. and A.A. Rao Ornamental aquarium fishes of India- 1999- - TFH United Kingdom. 4. Ratjak, K. and Zukal, R., Aquarium Fishes and Plants. 5. Shuler ML and Kargi F., Bioprocess Engineering: Basic concepts, 2nd Edition, Prentice Hall, Engelwood Cliffs, 2017.		
Books for Reference: 1. Beaven C.R. Hand Book of Fresh Water Fishes of India— Narendra Pub. House. 2. C. Srivastava, Fish Biology by C.B.— Narendra Pub. House 3. A D Kholakia, Ornamental Fish Culture and Aquarium Management Hardcover —2009 4. Goldfish Breeds and Other Aquarium Fishes, Their Care and Propagation: A Guide to 5. Herman Theodore Wolf, Freshwater and Marine Aquaria, Their Fauna, Flora and Management.		

YouTube Link:

<https://www.youtube.com/watch?v=jw8j6kQRIEo>

<https://www.youtube.com/watch?v=zDQy0IXozhs>

<https://www.youtube.com/watch?v=3Ilw1p0Fmvl>

<https://www.youtube.com/watch?v=IUUbINZzURo>

<https://www.youtube.com/watch?v=-gnqAPVbTDA>

Course Outcomes (COs)

By the End the Course, the Students will be able to

CO1 : Understand the global and national export potential of ornamental fish

CO2 : Distinguish exotic and indigenous fishes.

CO3 : Understand the breeding and rearing of live bearer species

CO4 : Acquire knowledge on ornamental fish breeding, rearing of egg layer species.

CO5 : Design and maintain the aquarium.

**Department of Computer Science &
Applications**

Certificate Course in PC Assembly & Maintenance

CERTIFICATE COURSE CODE : UBCSCC01

Objective of the Course:

To prepare the students for fundamentals of PC assembly and trouble shooting.

Learning Outcomes:

The student will assemble / setup and upgrade personal computer systems; diagnose and isolate faulty components; optimize system performance and install / connect peripherals; trouble shoot system issues

Methodology of teaching: Hands on approach

Expected Job Roles: Service Technician

**Duration of the Course
(in hours)** 80 hrs

Appr. Fees (INR): Rs.2500/-

**Minimum
Eligibility Criteria
and pre-
requisites, if any** Any student of Islamiah College

Outline of Course

S. No	Topic	Minimum No. of Hours
1.	Basic of computer, I/O devices	2 hrs
2.	Monitors (CRT/ LCD/LED),Memory	6 hrs
3.	Hard Disk (SATA, USB, Solid State)	2 hrs
4.	Study of different types of Mother Board	4 hrs
5.	Study of different Buses	2 hrs
6.	I/O Ports, graphic cards	2 hrs
7.	Installation of printer / modem /OS /scanner	4 hrs
8.	BIOS set up	2 hrs
9.	Recovery & Trouble shooting	2 hrs

10.	Preventive maintenance & Anti Virus	2 hrs
11.	Networking Fundamentals	2 hrs
Theory / Lecture Hours:		30 hrs
Practical / Tutorial / Lecture Hours:		50 hrs
Total Hours:		80 hrs

**Books recommended
for reference
and reading:**

Computer assembly &
maintenance.

CERTIFICATE COURSE IN NETWORK ADMINISTRATION

CERTIFICATE COURSE CODE : UBCSCC02

Objective of the Course:

By the end of the course, students will be able to describe and execute network administrator duties and utilities. They will know how to implement server organisation, user rights, user addition, maintenance of security and user accounting.

Learning Outcomes:

Demonstrate understanding of how computers communicate with each other and the methods employed to ensure that the communication is reliable.

Expected Job Roles: Network Technician

**Duration of the Course
(in hours)** 80 hrs

Appr. Fees (INR): Rs.2500/-

**Minimum Eligibility
Criteria and pre-
requisites, if any** Any student of the college with PC assembly
knowledge.

Outline of Course

S. No	Topic	Minimum No. of Hours
1.	Introduction to Computer Networks	2 hrs
2.	Networking Hardware	5 hrs
3.	Computer topology	3 hrs
4.	Network protocol	3 hrs
5.	Network Configuration	6 hrs
6.	Networks Models	6 hrs
7.	Types of networks	5 hrs
8.	Transmission medias	3 hrs
9.	Basic addressing	4 hrs
10.	Server installation	4 hrs
11.	Basic network troubleshooting	9 hrs
Theory / Lecture Hours:		50 hrs
Practical / Tutorial / Lecture Hours:		30 hrs
Total Hours:		80 hrs

**Books
recommended for
reference and
reading:**

The Practice of system & Network Administration 2nd edition by
Thomas Limoncelli

DOMESTIC AND LABORATORY DISCHARGE WATER TREATMENT METHOD AND PROCESS

CERTIFICATE COURSE CODE : UBCHCC03

Unit I: Sources of water: Surface sources, such as Ponds and lakes- Streams and rivers- Storage reservoirs and Oceans- underground sources, such as Springs- Infiltration wells and Wells

Physical Characteristics of water- Turbidity –Colour -Taste and Odour- Temperature - Chemical Characteristics –pH -Acidity-Alkalinity-Hardness-Chlorides-Sulphates-Iron-Solids-Nitrates

Unit II: Water hardness - Types of hardness - Units (Conductivity, Salinity and TDS - Dissolved Oxygen-Turbidity, TSS and Clarity) Classification - Chemical precipitation-Principles of lime softening - Removal of permanent hardness - Removal of temporary hardness

Unit III: Municipal Water Treatment Plant Design - Water Storage Tanks and Distribution Network- Rural Water Supply- Municipal Wastewater Quantity and Quality - Municipal Wastewater- Collection and Treatment - Ion exchange - Introduction and applications - The resin-Adsorption principles - Exchange capacity - Resin selectivity –Design parameters – Satabilizing the water - Fouling and breading

Unit IV: Preliminary and Primary Wastewater Treatment- Secondary Wastewater Treatment- Tertiary and Advanced Treatment- Residuals Management - Municipal Wastewater Treatment Plant Design Details- Treated Effluent Disposal Natural Methods of Wastewater Treatment- Hygiene and Sanitation in Rural/Semi-Rural Areas

Unit V: Reverse osmosis - Principles of reverse osmosis – Applications- Types of membranes- Pre-treatment- Membrane cleaning – Practical for Assembling Domestic Reverse Osmosis plants: Spun Filter – Pre carbon filter- Post carbon filter- Mineral filter – UV Light Advantages – Solenoid Uses- Copper filter – CTO filter installation uses and advantages.