

ISLAMIAH COLLEGE

(AUTONOMOUS)

VANIYAMBADI – 635 752

(AIDED & SELF FINANCE)



SYLLABI BOOK VII

8TH ACADEMIC COUNCIL MEETING

**(For the UG Candidates Admitted from 2015-2016
&
PG Candidates Admitted from 2016-2017)**

5TH MARCH 2016

LANGUAGES & NON MAJOR

SYLLABUS

For

All the Second Year Undergraduate Courses

URDU

ARABIC

HINDI

TAMIL

(UNDER CBCS)

2016-2017

SEMESTER III

(FOUNDATION URDU PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FUR301	URDU PAPER – III	4	EC07	4

UNIT - I:

1. QISSA-E-HATIM TAI --- Meer Amman Dehlavi
2. URDU ZUBAN KI IBTIDA AUR USKA IRTIQA
3. GENERAL ESSAY

UNIT II:

1. SIR SYED MARHOOM AUR URDU LITERATURE - Moulana Shibli Noumani
2. URDU KI IBTIDA KE BARE ME MUKTALIF NAZARIAT
3. SIR SYED AHMED KHAN

UNIT III:

1. NOOR JAHAN ... Mohammed Hussain Azad
2. GHALIB
3. HALI

UNIT IV:

1. KHANWADA-E-WALAJAHI KA EK GUMNAM SAH'ER-NAWAB MAHMOOD... Dr. Syed Sajjad Husain
2. IQBAL
3. FAIZ

UNIT IV:

1. MARHOOM KI YAAD MEIN
2. PREM CHAND
3. GENERAL ESSAY

BOOK PRESCRIBED:

1. FAIZAN-E-ADAB , APPLIED BOOKS, NEW DELHI
2. Guldasta-e-Mazameen-o-Insha Pardazi,
Published by Educational Book House, Aligarh

SEMESTER III
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5URNM31	BASIC URDU I	1	EC08	2

Unit I

Urdu alphabet, Reading & Writing practice in Urdu

Unit II

Word completion, Pronunciation, Connecting words.

Unit III

Vowels, Prepositions & Urdu Numerals.

Unit IV

Formation of Simple Sentences.

Unit V

Conversation & Urdu Calendar (Week days and Months).

SEMESTER IV

(FOUNDATION URDU PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FUR401	URDU PAPER – IV	3	EC10	4

OBJECTIVES: NON-DETAILED TEXT (SHORT-STORIES) & URDU DTP

UNIT - I:

1. KAFAN --- Munshi Prem Chand
2. NOOR O NAAR ... Ali Abbas Hussaini
3. URDU DTP

UNIT II:

1. JAMUN KA PED ... Krishan Chandar
2. KHUSH NASEEB .. Ali Akbar Amburi
3. URDU DTP

UNIT III:

1. RAHMAN KE JOTEY .. Rajinder Singh Bedi
2. BARF GUZEDA LOG .. Akbar Zahid
3. URDU DTP

UNIT IV:

1. DIL-E-NADAAN .. Ameerunnisa
2. AATHWAN PANKHA .. Shubaib Ahmed Kaaf
3. URDU DTP

UNIT V:

1. SAMJHOTA ... Aabid safi
2. PANKHADIYAN GULAB KI .. Rasheed Madrasi
3. URDU DTP

SEMESTER IV
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5URNM41	BASIC URDU II	2	EC11	2

Unit I

Basics of Urdu Grammar

Unit II

Names of flowers, fruits, birds, colours & Vegetables.

Unit III

Composition (A short paragraph consisting of four or five simple sentences).

Unit IV

Two simple poems.

Unit V

Translation (Technical terms and a passage).

SEMESTER III

(FOUNDATION ARABIC PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAR301	ARABIC PAPER – III	4	EC07	4

UNIT 1

Lesson 1 to 4

UNIT 2

Lesson 5 to 8

UNIT 3

Lesson 9 to 11

UNIT 4

Lesson 12 to 16

UNIT 5

Surath-ul-Hujurath Verse 1 to 9

Reference Book:

Durus-Al-Lugah-Al-Arabiya

Part II

by Dr. V. Abdur Raheem

Director, King Fahad Quran Translation Centre, Madina

Published by Islamic Foundation Trust, Chennai

Surath-ul-Hujurath from the Holy Quran

SEMESTER III
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ARNM31	BASIC ARABIC I	1	EC08	2

BASIC ARABIC I

UNIT 1

The Arabic Alphabet
The Vowel
The Vowel sign

UNIT 2

Kinds Arabic words
The Noun
The Verb
The Particle

UNIT 3

Definite & In-Definite

UNIT 4

Masculine & Feminine

UNIT 5

Singular, Dual & Plural

SEMESTER IV

(FOUNDATION ARABIC PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAR401	ARABIC PAPER – IV	3	EC10	4

UNIT 1

Lesson 17 to 19

UNIT 2

Lesson 20 to 23

UNIT 3

Lesson 24 to 27

UNIT 4

Lesson 28 to 31

UNIT 5

Surath-ul-Hujurath Verse 10 to 18

Reference Book:

Durus-Al-Lugah-Al-Arabiya

Part II

by Dr. V. Abdur Raheem

Director, King Fahad Quran Translation Centre, Madina

Published by Islamic Foundation Trust, Chennai

Surath-ul-Hujurath from the Holy Quran

SEMESTER IV
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ARNM41	BASIC ARABIC II	2	EC11	2

BASIC ARABIC II

UNIT 1

Subject and predicate
Adjective and its Noun

UNIT 2

Interrogatives
Pronouns

UNIT 3

The Pre Position
Subject, Verb, Object

UNIT 4

The Tens
Past Tens & Imperfect Tens

UNIT 5

Imperative and Negative Command
Nominal Sentences
Verbal Sentences

SEMESTER III

(FOUNDATION HINDI PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FHD301	HINDI PAPER III	4	EC07	4

OBJECTIVES: 1.To make the student able to appreciate Ancient and Medieval Poetry and to identify the peculiarities of each period and understand the literary thoughts and styles of that period. 2. To develop an outlook about the History of Hindi literature through literary descriptions of famous poets.3. To make them able to critically evaluate the drama prescribed for study.

UNIT –I. MEDIEVAL POETRY :

- 1.KABIR – DOHE 1 – 8 *only*
2. TULSIDAS - DOHE 1 – 8 *only*
3. RAHIM – DOHE 1 – 8 *only*
4. BIHARI – DOHE 1 – 8 *only*

UNIT –II. DRAMA : ANDHER NAGARI *by* BHARATENDU HARISCHANDRA

UNIT – III. IDIOMS AND PROVERBS : MEANINGS ONLY

(PRESCRIBE IDIOMS AND PROVERBS ENCLOSED)

UNIT –IV. APPLIED GRAMMAR -:1. SYNONYMS.

2. ANTONYMS
3. ONE WORD SUBSTITUTION.
4. TENSE – NO SUB DIVISIONS
5. CHANGE INTO ABSTRACT NOUNS.(Common Noun TO Abstract Noun & Adjective TO Abstract Noun)

UNIT –V. HISTORY OF HINDI LITERATURE : GENERAL

INFORMATION ABOUT THE PRESCRIBED POETS

BELONG TO FIRST THREE PERIODS --1.CHAND BARDAI

2. VIDYAPATHI 3. JAYASI 4. KESHAV DAS,

5.GHANANAND *only*.

BOOKS FOR STUDY : 1).RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN, ALLAHABAD, 2012. 2). ANDHER NAGARI, BHARATENDU, LOKBHARATHI PRAKASHAN, ALLAHABAD, 2011

BOOKS FOR REFERENCE:1. HINDI SAHITYA KA ITIHAAS,

RAMCHANDRA SHUKLA, KARVI PRAKASHAN, JAIPUR.2003

2. HINDI SAHITYA KA ITIHAAS, DR. NAGENDRA, NATIONAL PUBLISHING HOUSE, NEW DELHI. 1973.

3. VYAVAHARIK HINDI VYAKARAN by Dr.HARDEV BAHRI.
LOKBHARATHI PRAKASHN, ALLAHABAD, 1985

4. HINDI SHABDA SAMARTHYA by PRABHATH PRAKASHAN
NEW DELHI, 1985. ///00///

THIRD SEMESTER – HINDI PAPER – III

PRESCRIBED IDIOMS AND PROVERBS FOR SECTION – B :

- 1 ईद का चोंद होनादर्शन दुर्लभ होना / बहुत कम दिखाई देना ।
- 2 कोल्हू का वैल..... बहुत अधिक परिश्रम करनेवाला ।
- 3 उल्टी गंगा बहाना..... अनहोनी बात करना / प्रतिकूल बात करना ।
- 4 छाती पर मूंग दलना..... सामने रहकर दुःख देते रहना ।
- 5 तीन तेरह करना.....तितर वितर करना ।
- 6 टेढ़ी खीर..... मुश्किल काम ।
- 7 उल्टा चोर कोतवाल को डोंटे.....दोष अपना और दूसरों को धमकाना ।
- 8 अंगूठा दिखाना.....मना कर देना / तिरस्कार करना
- 9 गोबर गणेश होना.....मूर्ख और आलसी होना ।
- 10 हाथ मलना.....पछताना ।
- 11 दाँत खट्टे करना..... बुरी तरह हरा देना ।
- 12 रंगा सियार होना..... कपटी होना ऊपर से कुछ अंदर से कुछ होना ।
- 13 गागर में सागर भरना..... थोड़े में बहुत कुछ कहना ।
- 14 खरी खोटी सुनाना..... भला बुरा कहना ।
- 15 कान का कच्चा..... बात सुनकर तुरंत सच मान लेनेवाला ।
- 16 एक पंथ दो काज..... एक समय में दो कार्यों की सिद्धि ।
- 17 जिसकी लाठी उसकी भैंस.....ताकतवर की जीत होती है ।
- 18 नाच न जाने आंगन टेढ़ा.....काम करना नहीं आता पर
और चीजों में दोष निकालना ।
- 19 ऊँट के मुँह में जीरा.....अधिक जरूरतवाले को थोड़ा देना ।
- 20 एक अनार सौ बीमार.....एक चीज और चाहनेवाले बहुत ।
- 21 धोबी का कुत्ता न घर का न घाट का.....कहीं का न रहना ।
- 22 मन चंगा तो कठौती में गंगा..... मन शुद्ध हो तो घर पर ही
तीर्थाटन का फल ।
- 23 जैसा देश वैसा भेष.....जहाँ रहें वहीं की रीतियों का आचरण करना ।
- 24 दूर के ढोल सुहावने..... दूर के लोग या चीजें अच्छी मालूम पड़ना ।
- 25 खोदा पहाड़ निकली चुहिया.....परिश्रम अधिक पर लाभ कम ।

SEMESTER III
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5HDNM31	BASIC HINDI I	1	EC08	2

***Objectives:** To introduce the Hindi language to students who never had it at school. The students in this level will experience Hindi for the first time and will enjoy learning basic sounds, words and expressions of Hindi language.*

- UNIT – I VOWELS - CONSONANTS
COMPOUND LETTERS
BARAHKHADI
NASAL SOUNDS – ANUSWAR – ANUNASIK
- UNIT – II NOUN -PRONOUN
NAMES OF THE FRUITS, FLOWERS, BIRDS, ANIMALS,
COLOURS – DAYS and
NUMBERS 1 TO 20 ONLY.
- UNIT –III USAGE OF ka, kI, ko
USAGE OF caah & caaihe.
USAGE OF PREPOSITIONS - **maoM pr sao ko ilae ko pasa ko baad kI Aor ko naIcao ko ibanaa ko baaro maoM only**
- UNIT – IV ROOT VERBS
IMPERATIVE SENTENCES
INTERROGATIVE SENTENCES
- UNIT – V PRESENT TENSE
PRESENT CONTINUOUS TENSE
ADJECTIVES

BOOKS FOR STUDY:

1.SARAL HINDI PARICHAY, D.B.H.PRACHAR SABHA, TRICHY.2015

BOOKS FOR REFERENCE:

1.SARAL HINDI BODHINI, D.B. H.PRACHAR SABHA, CHENNAI. 2011

2.TEACH YOURSELF HINDI , MOHINI RAO, HIND POCKET BOOKS, NEW DELHI. 2004

SEMESTER IV

(FOUNDATION HINDI PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FHD401	HINDI PAPER IV	3	EC10	4

Objectives : 1. To make the students understand the development of modern Hindi Poetry. 2. To acquaint them with the thoughts, ideas and ideologies of modern Hindi Poets. 3. Familiarising technology of Translation Practice with its possibilities and limitations. 4. Computer Terminology in Hindi helps them to face the challenges of Competitive world effectively.

UNIT –I. MODERN POETRY : 1. YASHODHARA KA ANUTHAP by

MYTHILISHARAN GUPTA

2. JAAGO JEEVAN KE PRABHAT by

JAYSHANKAR PRASAD

3. SUKH - DUKH by PANTH

4. VE MUSKATE PHOOL NAHI by

MAHADEVI VARMA

5. TOOTA PAHIYA by DHARMAVEER

BHARATHI .

UNIT –II. LANGUAGE & APPLIED GRAMMAR: 1. CORRECTION OF SENTENCES, 2. TATSAM TO TADBHAV & VICE – VERSA.

UNIT –III. HISTORY OF HINDI LITERATURE : GENERAL

INFORMATION ABOUT THE PRESCRIBED POETS /

WRITERS FROM MODERN PERIOD. 1. AGNEYA

2. DINKAR 3. MANNU BHANDARI 4. JAGDISH GUPTA

5. DHOOMIL

UNIT –IV. COMPUTER / INTERNET TERMINOLOGY –

PRESCRIBED TERMS FROM ENGLISH TO HINDI.

UNIT –V .TRANSLATION : SENTENCES FROM ENGLISH TO

HINDI. PRESCRIBED : Lessons 16, 17, 18, 19 only.

BOOKS FOR STUDY : 1). RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN, ALLAHABAD, 2012 2). ANUVAD ABHYAS – I, D.B. HINDI PRACHAR SABHA, CHENNAI, 2009

BOOKS FOR REFERENCE : 1 VYAVAHARIK HINDI VYAKARAN by Dr. HARDEV BAHRI, LOKBHARATHI PRAKASHAN, ALLAHABAD. 1985

2. RACHNA RASHMI 1 & 2 ,VINOD PUSTAK MANDIR, AGRA. 2001

3. HINDI BHASHA AUR NAGARI LIPI, BHOLANATH TIWARI,
LOKBHARATI, ALLAHABAD. 1996 //

FOURTH SEMESTER – HINDI

Prescribed Computer / IT / Internet Terminology from English to Hindi -

Section B

1. Access = अभिगम
2. Automation = स्वचालन
3. Axis = धुरी, अक्ष
4. Binary = द्विपदी , द्विआधारी
5. Bad Sector = अनुपयोगी खण्ड
6. Blogger = चिट्ठाकार
7. Browser = विचरक
8. Coding = कूट लेखन
9. C.P.U = केंद्रीय प्रक्रमन इकाई
10. Circuit = परिपथ
11. Component = घटक
12. Computer = संगणक, अभिकलित्र
13. Central Memory = केंद्रीय स्मृति
14. Ctrl. = नियंत्रण
15. Data = तथ्य ,आंकडा
16. Database = आंकडा आधार
17. Digital = अंकीय
18. Explorer = अन्वेषक
19. FAQ = आम प्रश्नोत्तरी
20. Home Page = मुख पृष्ठ पहला पन्ना
21. Input = निवेश
22. Internet = अंतर्जाल
23. Key Board = कुंजीपटल
24. Network = जाल तंत्र
25. Operating System = प्रचालन तंत्र
26. Password = कूट शब्द
27. Search Engine = खोजक खोज इंजिन
28. Word Processor = शब्द संसाधक
29. Storage = भंडारण
30. Text = पाठ।

SEMESTER IV
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5HDNM41	BASIC HINDI II	2	EC11	2

Objectives : *To continue to develop and enhance students' introductory level toward a higher level of reading, writing and oral skills in Hindi.*

- UNIT – I FUTURE TENSE
 NUMBER
 GENDER
- UNIT - II PAST TENSE
 SIMPLE PAST TENSE WITHOUT ‘nao’
 SIMPLE PAST TENSE WITH ‘nao’
- UNIT –III COMMUNICATIVE HINDI
 DIALOGUE WRITING
 IMPORTANT SITUATIONS (Between Two Passengers, Two
 Friends, Teacher and Student, at Market and at Railway Station.)
- UNIT –IV TRANSLATION PRACTICE
 SIMPLE SENTENCES
 ENGLISH TO HINDI
- UNIT –V TRANSLATION PRACTICE
 SIMPLE SENTENCES
 HINDI TO ENGLISH

BOOK FOR STUDY :

- 1.SARAL HINDI BODHINI, D.B.H.PRACHAR SABHA,CHENNAI, 2011

BOOK FOR REFERENCE :

1. HINDI PRAYOG, PART – I, D.B.H.PRACHAR SABHA,CHENNAI, 2005
- 2.BOLCHAL KI HINDI , Dr. SUSHEELA GUPTA, LOKBHARATI
PRAKASHAN, ALLAHABAD. 2006
3. NAYEE HINDI RACHNA- PART – II, D.B.HINDI PRACHAR
SABHA,CHENNAI, 2008
4. ANUVAD ABHYAS – I,D.B.HINDI PRACHARSABHA,CHENNAI,2009

SEMESTER I
(FOUNDATION TAMIL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FTA101	TAMIL PAPER I	4	EC01	4

Objectives

இக்கால இலக்கியங்களான கவிதை, சிறுகதை, உரைநடை, நாடகம் போன்றவற்றை அறிமுகப்படுத்தி மாணவர்களின் படைப்பாற்றலை வளர்த்தல், போட்டித் தேர்வுகளில் பங்கேற்க மாணவர்களுக்கு மொழித்திறன் பயிற்சியளித்தல்.

அலகு 1 : கவிதை

பாரதியார் கவிதை (குயில்பாட்டு)
1. குயில் 2. குயில்பாட்டு 3. குயிலின் காதற்கதை
பாரதிதாசன் (குடும்ப விளக்கு)
(வேட்புபனுக்கு மீண்டும் வாய்ப்பு) திருமணம் (மூன்றாம் பகுதி)
கவிமணி தேசிக விநாயகம் பிள்ளை பாடல்கள்
அப்துல் கலாம் கவிதை (தினமணி)

அலகு 2 : சிறுகதை

மேல்பார்வை தண்ணீர் (1-21) - சுந்தர ராமசாமி
வளையாத பனைகள் - நந்தகோபால்
கவிக்கோ சிறுகதை

அலகு 3 : உரைநடை

தன்னம்பிக்கை முன்னேற்றத்தின் முதல் படி - சிவசூரியன்
தன்னம்பிக்கைக் கட்டுரை - பி.கே.மனோகரன்
படிப்பு சுமையல்ல சுகம் - பசுமைக் குமார்
1. கல்வி உங்களுக்காகவே 2. மாணவர்களுக்கு ஆளுமைத் திறன் அவசியம்

அலகு 4 : நாடகம்

வேலைக்காரி - பேரறிஞர் அண்ணா (1 - 25 காட்சிகள் வரை)

அலகு 5 : மொழித்திறன், இலக்கிய வரலாறு

சந்திப்பிழை நீக்குதல்
ஒருமை பன்மை பிழை நீக்குதல்
மரபுப் பிழைகள்
வழிச் சொற்களை நீக்குதல்
பிறமொழிச் சொற்களை நீக்குதல்
ஒலி வேறுபாடு அறிந்து சரியான பொருளை அறிதல்
அகர வரிசைப்படுத்தல்
இக்கால இலக்கிய வரலாறு
(கவிதை, சிறுகதை, புதினம், உரைநடை)
இயற்கை மருத்துவம் - ஓர் அறிமுகம்

பார்வை நூல்கள்:-

1. பாரதிதாசன் (குடும்ப விளக்கு)
பாவேந்தர் பாரதிதாசன்
பாவை பப்ளிகேஷன்ஸ்
142 ஜானி ஜான் கான் சாலை
இராயப்பேட்டை
சென்னை - 600 014
இரண்டாம் பதிப்பு - ஜூன் 2014
2. வேலைக்காரி
பேரறிஞர் அண்ணா

பாவை பப்ளிகேஷன்ஸ்
142, ஜானி ஜான் கான் சாலை,
இராயப்பேட்டை
சென்னை - 600 014
ஐந்தாம் பதிப்பு - ஜூன் 2011

3. மேல்பார்வை
சுந்தர ராமசாமி
நிர்மால்யம்
48, முதலிமார் தெரு
கிருஷ்ணன் கோவில்
நாகர்கோவில் - 629 001
நான்காம் பதிப்பு (2001)
4. படிப்பு சுமை அல்ல சுகம்
பசுமைக்குமார்
தாமரை பப்ளிகேஷன்ஸ் (பி) லிட்.
41 -B சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்
அம்பத்தூர்
சென்னை - 600 098
ஐந்தாம் பதிப்பு (நவம்பர் 2014)
5. தன்னம்பிக்கை முன்னேற்றத்தின் முதல்படி
சிவசூரியன்
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்.
41 - B சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்
அம்பத்தூர்
சென்னை - 600 098
ஐந்தாம் பதிப்பு - ஏப்ரல் 2013
6. அப்துல் கலாம் கவிதை
ப.சிவராஜி (தினமணி)
(15.10.2015 நாளிட்ட நாளிதழ்)
வேலூர் பதிப்பு
7. வளையாத பனைகள்
இரா.நந்தகோபால்
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்.
41 - B, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்,
அம்பத்தூர்
சென்னை - 600 098
இரண்டாம் பதிப்பு (ஜனவரி 2014)
8. மொழித்திறன் (பொதுத்தமிழ்)
முகம்மது அலி ஜின்னா
அன்னம் நூலங்காடி, 65/23, கந்தசாமி வாத்தியார் தெரு, தருமபுரி
9. இலக்கிய வரலாறு
கு.வே. பாலசுப்பிரமணியன்
10. பாரதியார் கவிதை
மணிவாசகர் பதிப்பகம்
8/7 சிங்காரதெரு, பாரிமுனை, சென்னை -800 108. செம்பதிப்பு - பிப்ரவரி 2000
11. கவிமணி தேசிக விநாயகம் பிள்ளை பாடல்கள்
12. கவிக்கோ சிறுகதை
தினமணி மணி விழா மலர் (1998)
13. தன்னம்பிக்கைக் கட்டுரை - பி.கே.மனோகரன்.

SEMESTER III
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5TANM31	அறிவியல் தமிழ் - I	1	EC08	2

Objectives

அறிவியல் தமிழ்-1 மூலமாக மாணவர்களுக்குக் கற்பிப்பது. கணினிப் பற்றிய வரலாற்றை அறிமுகப்படுத்துவது. மின்னஞ்சல், கடவுச்சொல் உருவாக்கும் முறையைத் தெரிவிப்பது, கணினி வழி தமிழ்க் கற்றலை ஊக்குவிப்பது.

அலகு 1 : அறிவியல் தமிழ்

அறிவியல் தமிழ் அறிமுகம் - I
அறிவியல் தமிழ் அமைப்பு - I
அறிவியல் தமிழ் வளர்ச்சி - I

அலகு 2 : கணினிப் பயன்பாட்டியல்

கணினிப் பயன்பாடு
தமிழ்க் கற்பித்தலில் கணினியின் பங்கு
கணினியின் அமைப்பு

அலகு 3 : தமிழும் இணையமும்

இணையம் - ஓர் அறிமுகம்
இணையத்தின் தோற்றமும் வளர்ச்சியும்
தமிழ் மின்னஞ்சல், தமிழ் மின் நூலகம்

அலகு 4 : அறிவியல் கலைச் சொல்லாக்கம்

கலைச் சொல்லாக்கம் - ஓர் அறிமுகம்
கலைச் சொல்லாக்கப் பயன்
கலைச் சொல்லாக்கம் உருவாக்கும் முறை

அலகு 5 : தமிழ் இணைய இதழ்கள்

இணையதளம்
இணைய இதழ்கள், வலைப்பூ - ஓர் அறிமுகம் - I
இணைய இதழ்களும் வகைப்பாடும்
தமிழில் இணைய தளங்களும் இதழ்களும்

பார்வை நூல்கள்:-

1. தமிழும் இணையமும்
முனைவர் மு. இளங்கோவன்
வயல்வெளிப் பதிப்பகம், (ஆகஸ்டு 2009)
இடைக்கட்டு, உள்கோட்டை (அஞ்சல்)
அரியலூர் மாவட்டம்.
2. இணையமும் இனியத் தமிழும்
முனைவர் க.துரையாசன்
இசைப் பதிப்பகம் (ஜூன் 2009)
24, சபரி நகர்
டாக்டர் மூர்த்தி சாலை
கும்பகோணம் - 1
3. அறிவியல் தமிழ் - வா.செ.குழந்தைசாமி

**SEMESTER IV
(FOUNDATION TAMIL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FTA201	TAMIL PAPER I1	3	EC04	4

Objectives

பக்தி இலக்கியங்கள், சிற்றிலக்கியங்கள் வாயிலாக மாணவர்களுக்கு அறிக்கருத்துக்களைப் போதித்தல், பாடத்திட்டத்தில் இடம் பெற்றிருக்கும் கட்டுரைகளின் வாயிலாக மாணவர்களிடையே தன்னம்பிக்கை வளர்த்தல். போட்டித் தேர்வுகளில் பங்கேற்க மாணவர்களுக்கு மொழித்திறன் பயிற்சியளித்தல்.

அலகு 1 : பக்தி இலக்கியங்கள்

திருவெம்பாவை – மாணிக்கவாசகர் (5 பாடல்கள்)
பெருமாள் திருமொழி – குலசேகராழ்வார் (5 பாடல்கள்)
சீறாப்புராணம் உமறுப்புலவர் (தொழுகை வந்த வரலாற்றுப் படலம்)
திருக்காவலூர் கலம்பகம் - வீரமாமுனிவர் (5 பாடல்கள்)

அலகு 2 : சிற்றிலக்கியங்கள்

முக்கூடற் பள்ளு – (5 பாடல்கள்)
தமிழ் விடுதாது – (20 பாடல்கள்)
ஆயிஷா நாச்சியார் பிள்ளைத்தமிழ் - கா.மு.ஷெரிப் (வருகைப்படலம்)

அலகு 3 : ஆட்சித்தமிழ் - கி.ராமலிங்கம்
பணிப் பண்பாடு – வெ. இறையன்பு

அலகு 4 : இசுலாமியத் தமிழ்ச் சிற்றியலக்கியங்கள்
உன்னை வெல்க – அப்துற் றஹீம்

அலகு 5 : மொழித்திறன், இலக்கிய வரலாறு

ஓரெழுத்து ஒருமொழிக்குரிய பொருளைக் கண்டறிதல்
தொடரால் குறிக்கப்பெறும் சான்றோர்
அடைமொழியால் குறிக்கப்பெறும்
நூல் சொற்களை ஒழுங்குபடுத்தி சொற்றொடராக்கல்
பக்தி இலக்கிய வரலாறு
சிற்றிலக்கிய வரலாறு

பார்வை நூல்கள்:-

1. திருவெம்பாவை
மாணிக்க வாசகர்
சாரதா பதிப்பகம் (ஜூலை 2011)
சென்னை – 14
2. பெருமாள் திருமொழி
குலசேகராழ்வார்
ராமையா பதிப்பகம் (மே.2010)
சென்னை – 14
3. சீறாப்புராணம்
உமறுப்புலவர்
பதிப்பித்தவர் - ஹாஜி எம். முகம்மது யூசுப்
கவியோகி – நாச்சிக் குளத்தார்
உதய மார்தாண்டபுரம் அஞ்சல்
திருவாரூர் மாவட்டம் (மே – 1999)

4. திருக்காவலூர் கலம்பகம்
வீரமாமுனிவர்
சாரதா பதிப்பகம் (2012)
சென்னை - 14
5. முக்கூடற் பள்ளு
சாரதா பதிப்பகம் (ஆகஸ்ட் - 2012)
சென்னை - 14
6. தமிழ்விடு தூது
சாரதா பதிப்பகம் (2013)
சென்னை - 14
7. ஆயிஷா நாச்சியார் பிள்ளைத்தமிழ்
கவி. கா.மு. வெளிப்
8. ஆட்சித் தமிழ்
கி.ராமலிங்கம்
9. பணிப் பண்பாடு
வெ. இறையன்பு
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்
41 - பி சிட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்
அம்பத்தூர், சென்னை - 600 098
நான்காம் பதிப்பு - ஏப்ரல் - 2013
10. கட்டுரைக் கோவை -II
ப.சிவராஜி
இலக்கியா பதிப்பகம்
இராமநாயக்கன் பேட்டை
வாணியம்பாடி - 635 751
11. உன்னை வெல்க
அப்துல் - றஹீம்
யுனிவர்ஸல் பப்ளிஷர்ஸ் (பதினோராம் பதிப்பு - செப் 2012)
சென்னை - 17
12. மொழித்திறன்
வர்த்தமானன் பதிப்பகம் (மூன்றாம் பதிப்பு-ஜூன்-2006)
ஏ.ஆர்.ஆர்.வளாகம்
141, உஸ்மான் சாலை,
தி.நகர், சென்னை - 17
13. தமிழ் இலக்கிய வரலாறு
கா.கோ. வேங்கடராமன்
கலையக வெளியீடு
பரமத்தி வேலூர்
நாமக்கல் மாவட்டம் - 638 192

SEMESTER IV
(NON MAJOR PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5TANM41	அறிவியல் தமிழ் - II	2	EC11	2

Objectives

அறிவியல் தமிழ் மூலமாக மாணவர்களுக்குக் கற்பிப்பது. கணினி பற்றிய வரலாற்றை அறிமுகப்படுத்துவது. இணைய வரலாறு, இணைய வழிக் கலந்துரையாடல், தமிழ் இணையப் பல்கலைக்கழகம், இணைய வேலை வாய்ப்பு மையங்கள் ஆகியவற்றை மாணவர்களுக்கு அறிமுகப்படுத்துவது.

அலகு 1 : அறிவியல் தமிழ்

அறிவியல் தமிழ் அறிமுகம் - II
அறிவியல் தமிழ் அமைப்பு - II
அறிவியல் தமிழ் வளர்ச்சி - II

அலகு 2 : இணையமும் தமிழும்

இணைய அறிமுகம் - II
தமிழில் இணைய வளர்ச்சி
இணையம் வழி தமிழ்க் கற்றல்

அலகு 3 : மின்னஞ்சல்

மின்னஞ்சல் முகவரி
கடவுச் சொல்
மின்னஞ்சல் அனுப்பும் முறை

அலகு 4 : மின் நூலகம்

தமிழ் இணைய இதழ்கள் - II
தமிழ் இணையப் பல்கலைக்கழகம்
கல்வி சார் இணைய தளங்கள்

அலகு 5 : இணைய வழி வேலை வாய்ப்பு

வேலை வாய்ப்பு இணைய தளங்கள்
இணைய வேலை வாய்ப்பு மையங்கள்
வேலை வாய்ப்பு இதழ்கள்

பார்வை நூல்கள் :-

1. தமிழும் இணையமும்
முனைவர் மு. இளங்கோவன்
வயல்வெளிப் பதிப்பகம், (ஆகஸ்டு 2009)
இடைக்கட்டு, உள்கோட்டை (அஞ்சல்)
அரியலூர் மாவட்டம்.
2. இணையமும் இனியத் தமிழும்
முனைவர் க.துரையாசன்
இசைப் பதிப்பகம் (ஜூன் 2009)
24, சபரி நகர்
டாக்டர் முர்த்தி சாலை
4. கும்பகோணம் - 1 அறிவியல் தமிழ் - வா.செ.குழந்தைசாமி

DEPARTMENT OF ENGLISH

SYLLABUS

For

All the First Year Undergraduate Courses

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

SEMESTER-III
(FOUNDATION ENGLISH)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FEN301	ENGLISH PAPER III	5	EC09	6

OBJECTIVE:

The prime objective of this paper is to promote the linguistics competence into the minds of the young learners through teaching the basics of English and acquainting them with situational dialogues and expose the learners to the production and receptive skills.

UNIT-I

SHORT STORIES

1. THE LAST LEAF
O. Henry
2. THE CABULIWALLAH
Rabindranath Tagore

UNIT-II

SHORT BIOGRAPHIES

1. R.K. NARAYAN
2. Dr. S. RADHAKRISHNAN

UNIT-III

COMMUNICATION SKILLS

1. SOUNDS AND SYMBOLS
2. WORDS AND PHRASES TO TALK ABOUT POSSIBILITIES
3. ASKING THE SCHEDULE
4. TELLING THE TIME
5. MEETING AND GREETING PEOPLE
6. TELEPHONE ETIQUETTE
- 7.

UNIT-IV

GRAMMAR

1. SUBJECT AND PREDICATE
2. DEGREES OF COMPARISON
3. RELATIVE CLAUSES: with *who*, *which* and *that*
4. RELATIVE CLAUSES: *whose*
5. RELATIVE CLAUSES: often subjects of main clauses

UNIT-V

WRITING ESSAYS

1. PART- TIME JOBS
2. THE INTERVIEW
3. CHILD LABOUR
4. THE USES AND ABUSES OF ADVERTISEMENT
5. GLOBAL WARMING
6. HUMAN RIGHTS
7. THE EVILS OF DOWRY SYSTEM
8. WHEN CHARACTER IS LOST, EVERYTHING IS LOST

Books for study:

TEXT BOOK: 1. Foundation English for Semester III – published by Islamiah College (Autonomous), Vaniyambadi.

**SEMESTER-IV
(FOUNDATION ENGLISH)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FEN401	ENGLISH PAPER IV	5	EC12	6

OBJECTIVE:

The prime objective of this paper is to promote the linguistics competence into the minds of the young learners through teaching the basics of English and acquainting them with situational dialogues and expose the learners to the production and receptive skills.

UNIT-I SHORT STORIES

1. WITH THE PHOTOGRAPHER
Stephen Leacock
2. THE WORLD-RENOWNED NOSE
V.M. Basheer

UNIT-II SHORT BIOGRAPHIES

1. A.P.J. ABDUL KALAM
2. STEVE JOBS

UNIT-III COMMUNICATION SKILLS

Conversational Etiquette

1. Formal Communication
2. Informal Communication
3. Semi-Formal Communication
4. Group Discussions

UNIT-IV GRAMMAR

1. JUMBLED LETTERS
2. ACTIVE AND PASSIVE VOICE:
Tenses And Agreement
Verb With Two Objects
Use Of 'It'.
3. DIRECT AND INDIRECT SPEECH:
Positive And Negative Statement
And Questions
4. MODALS:
Positive And Negative Questions
5. ADVERBIAL CLAUSES

UNIT-V WRITING

1. PREPARING A RESUME'
2. JOB COVER LETTER
3. TIPS FOR PREPARING JOB INTERVIEW
4. LISTENING TO AND ANSWERING INTERVIEW
5. THINGS TO BE PREPARED BEFORE THE INTERVIEW
 - 5.1 THINGS TO CARRY FOR THE INTERVIEW
 - 5.2 FREQUENTLY ASKED QUESTIONS

Books for study :

TEXT BOOK:

1. Foundation English for Semester IV – published by Islamiah College (Autonomous), Vaniyambadi.

SYLLABUS
For
B.A.ENGLISH
SEMESTERS – III & IV
(UNDER CBCS)
2016-2017

**SEMESTER-III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5EN3001	ENGLISH POETRY	5	CC07	5

OBJECTIVE:

- *To enhance the learners to comprehend different themes , period in which it has written and the techniques applied by listed poets.*
- *To enhance the learner how the figurative language is used as medium to set the tone.*
- *To make the students reflect upon the creative process of any two works.*

UNIT-I

John Milton - On His Blindness
William Wordsworth - Daffodils
-The Solitary Reaper

UNIT-II

John Keats -Ode on a Grecian Urn
Robert Browning -The Last Ride Together

UNIT-III

Alfred Lord Tennyson -Ulysses

UNIT-IV

Matthew Arnold -Dover Beach

UNIT-V

W.B. Yeats -Sailing to Byzantium

URLs

- 1.<http://study.com/academy/lesson/on-his-blindness-summary-theme-analysis.html>
- 2.<http://www.enotes.com/topics/on-his-blindness>
- 3.<https://beamingnotes.com/2013/05/21/summary-and-analysis-of-daffodils-by-william-wordsworth/>
- 4.<http://www.sparknotes.com/poetry/keats/section4.rhtml>
- 5.<http://www.victorianweb.org/authors/arnold/touche4.html>
- 6.<http://literatureguides.weebly.com/analysis-of-daffodils-by-william-wordsworth.html>

**SEMESTER-III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5EN3002	SHAKESPEARE	3	CC08	4

UNIT-I & II

Merchant of Venice

UNIT-III & IV

Macbeth

UNIT-V

Sonnets (17&18)

URLs

Unit-1&II- 1. <http://www.sparknotes.com/shakespeare/merchant/>
2. <http://www.cliffsnotes.com/literature/m/the-merchant-of-venice/play-summary>

Unit-III&IV- 1. <http://www.cliffsnotes.com/literature/m/macbeth/play-summary>
2. <http://www.enotes.com/topics/macbeth>

Unit-V 1. <http://www.shmoop.com/sonnet-17-neruda/summary.html>
2. <http://www.shmoop.com/sonnet-18/section-1-lines-1-8-summary.html>
3. <http://www.gradesaver.com/shakespeares-sonnets/study-guide/summary-sonnet-18-shall-i-compare-thee-to-a-summer-day>

**SEMESTER-III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ENAL31	ALLIED-THE HISTORY OF ENGLISH LANGUAGE	4	CC09	5

OBJECTIVE:

- *To picture the evolution from Old English (450-1100 AD), Middle English (1100-circa 1500 AD) to Modern English (since 1500).*
- *To portrait the words that has been passed up till now, coined by Roman merchants and soldiers.*
- *To paint the idea of what life was like in fourteenth century.*

UNIT-I

The Indo-European Family of Languages

UNIT-II

Influence of Shakespeare on the English Language

UNIT-III

Change of Meaning in English Language vocabulary Growth

UNIT-IV

The Evolution of Standard English

UNIT-V

Indian Loan Words in English

URLs

1.https://en.wikipedia.org/wiki/History_of_the_English_language_%28education%29

2.<http://www.studyenglishtoday.net/english-language-history.html>

3.<http://www.open.edu/openlearn/languages/english-language/the-history-english-ten-minutes>

**SEMESTER-III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ENAL32	ALLIED-ENGLISH FOR COMMUNICATION	3	AEC3	4

OBJECTIVE :

- *To teach how pre-read and scan the academic materials to get its meaning.*
- *To teach the writer's purpose of setting the tone in the context.*
- *To enable him to synthesize the ideas from what they have comprehended.*

UNIT-I

1. The importance of communication
2. Interpersonal communication

UNIT – II

- 1.Body language

UNIT - III

1. Dealing with people
2. Helping people to like you

UNIT -IV

- 1.Meeting
- 2.Preparation
- 3.Content

UNIT - V

1. The Role of Visual Aids
2. Appearance and Attitude
3. Developing Good Habits
4. Giving up Bad Habits
5. Overcoming nervousness and Tension
6. Delivery
7. Audience

Books for study :

DR. K.M.PRABU- "SKILLS FOR COMMUNICATION AND PRESENTATION"

URL

- 1.http://www.myenglishpages.com/site_php_files/speaking.php

**SEMESTER-IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5EN4001	ENGLISH LANGUAGE TEACHING	5	CC10	5

OBJECTIVE :

- *To set an aim to reflect an individual's personality through the language development*
- *To enable learners to have deeper understanding of meaning from the context.*
- *To teach teach the 44 sounds of 26 English alphabets.*

Unit – I

1. Objectives of teaching English
2. Bloom's Taxonomy of Educational Objectives

Unit – II

1. Interference and transfer from the mother tongue
2. Listening activities – dictation, following a route, listening to instructions, jigsaw listening.
3. Techniques in teaching speaking
4. Barriers of effective communication

Unit – III

1. Bilingual method
2. Direct method
3. The audio lingual method
4. Structural approach
5. Oral approach
6. Eclectic approach

Unit – IV

1. Using News media in ELT Classroom
2. Teaching English Intonation to ESL/EFL students

Unit- V

1. Characteristics of good handwriting
2. Developing good handwriting
3. Planning and Design in Teaching and Learning
4. Changing roles of a Teacher

Book for Study: 1. Dr. S.V. Shrangare, English Language Teaching, 2011

**SEMESTER-IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5EN4002	AMERICAN LITERATURE-I	3	CC11	4

OBJECTIVE :

- *To create an awareness of historical, cultural and formal issues.*
- *To make learner to compete with complex literary texts.*
- *To make learners to use them as primary and secondary sources.*

UNIT-I (PROSE)

Ralph Waldo Emerson -Self Reliance

UNIT-II (POETRY)

Emily Dickinson	-Because I Could Not Stop for Death
Edgar Allen Poe	-The Raven

UNIT-III (POETRY)

Robert Frost	-Birches
e.e. cummings	-The Cambridge Ladies

UNIT-IV (DRAMA)

Tennessee Williams -Glass Menagerie
Eugene O'Neill - Thirst

UNIT-V (NOVEL)

Ernest Hemingway -The Old Man and the Sea

URLs:

1. <http://www.mrgunnar.net/ap.cfmsubpage=348371>
2. <http://www.cliffsnotes.com/literature/g/the-glass-menagerie/play-summary>
3. <http://www.sparknotes.com/lit/oldman/>
4. <http://www.cs.cmu.edu/~spok/metabook/thirst.html>

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ENAL41	ALLIED- AN INTRODUCTION TO AMERICAN CULTURE I	4	CC12	5

OBJECTIVE:

- *It focuses on the traditional values that have attracted people to the United States for well over 200 years and traces the effects of these values on American life.*
- *It helps the readers to compare their traditional values, freedom, cultural diversity and equal opportunity with those themes in the five units.*
- *It helps to develop the reading skills, to compare and contrast, building their vocabulary and other language aspects.*

UNIT I

Understanding The Culture Of United States
A Nation Of Immigrants – Cultural Pluralism

UNIT II

American's Traditional Values
Religious And Cultural Diversity

UNIT III

Individual Freedom And Self-Reliance

UNIT IV

The American Religious Heritage

UNIT V

Equality Of Opportunity And Competition

Book for Study:

Maryanne Kearny Datesman, Joann Crandall and Edward N. Kearny, American Ways, Longman, 2005.

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5ENAL42	ALLIED-COMPUTER LITERACY	3	AEC4	4

OBJECTIVE:

It is more evident that the fresher who seek job opportunity must primarily possess the computer skill. In order to run the business more effectively and promising and to share the data worldwide the employer expects basic computer literacy to communicate.

Unit I

About Windows – My Computer – My documents – Recycle Bin – Wall Paper – Screen Saver - Time and Date – Windows Accessories – Resizing and Moving a Window

Unit II

Formatting in MS Word – Formatting the text – Text Effects – Aligning the text – Applying Border and Shading – Adding Bullets and Numbering

Unit III

Microsoft Office PowerPoint

– Starting – Title Bar – Ribbon – Quick Access Tool Bar – Slides/Outline Pane – Creating a new presentation – Inserting Slides – Saving – Slide show – Closing the Presentation – Opening a saved file

Unit IV

Microsoft Office Publisher

-to create Newsletters, Web Page, Poster, Chart and Certificate

Unit V

Apps [Applications] – Vocaroo – Skype – Blogging – Podcast

Reference Book

Peter Norton- Introduction to Computers 2009 7th Ed, TMH Publication

SYLLABUS
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M.A. ENGLISH
SEMESTER- (I & II)
(UNDER CBCS)

2016-2017

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN1001	CHAUCER AND ELIZABETHAN AGE	5	6

Objective:

The learners will have the inspiration from the visual arts, literature, theatre and music from the golden period of English.

UNIT I (POETRY)

Geoffery Chaucer	-Prologue to the Canterbury Tales (The Knight, The Wife of Bath & The Monk)
Edmund Spenser	-Epithalamion

UNIT II (POETRY)

John Donne	-Ecstasy
	-Death, Be Not Proud
William Shakespeare	-Let me not to the marriage of true minds (Sonnet: 116)

UNIT III (PROSE)

Francis Bacon	-Of Truth, Of Marriage and Single life
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UNIT IV (DRAMA)

Webster	-The Duchess of Malfi
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UNIT V (DRAMA)

Ben Jonson	-Every Man in His Humour
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URLs:

- 1.<http://www.cliffsnotes.com/literature/c/the-canterbury-theses/summary-and-analysis/the-prologue>
- 2.<http://www.gradesaver.com/spensers-amoretti/study-guide/summary>
- 3.<http://www.shmoop.com/the-duchess-of-malfi/suffering-theme.html>
- 4.<http://www.enotes.com/topics/every-man-his-humour>

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN1002	THE NEO CLASSICAL AGE	5	6

OBJECTIVE:

- *The learners will have the inspiration from the visual arts, literature, theatre and music from the decorative Western movements.*
- *To draw the inspiration from the Classical work of Greece or Rome.*
- *To give the learners the picture of 18th century as the Age of Enlightenment.*

UNIT I (POETRY)

John Milton (1608-1674) -Paradise Lost Book IX (Temptation & Fall)

UNIT II (POETRY)

Andrew Marvell (1621-1678) -To His Coy Mistress
John Dryden (1631-1695) -Mac Flecknoe
Alexander Pope (1688-1744) -Epistle To Dr. Arbuthnot

UNIT III (PROSE)

Dr. Johnson -Life of Milton

UNIT IV (DRAMA)

Sheridan -The Rivals
William Congreve -The Way of the World

UNIT V (NOVEL)

Daniel Defoe (1660-1731) -Robinson Crusoe
Jonathan Swift (1667-1745) -Gulliver's Travels

URLs:

1. <http://www.shmoop.com/to-his-coy-mistress/summary.html>
2. <http://spenserians.cath.vt.edu/TextRecord.php?textsid=34942>
3. <http://www.cliffsnotes.com/literature/w/the-way-of-the-world/play-summary>
4. <http://www.sparknotes.com/lit/crusoe/summary.html>

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN1003	THE ROMANTIC AND THE VICTORIAN AGES	4	6

OBJECTIVE:

To portrait the the ideals of the 19th century through the emotional, personal, natural and artistic themes of memorable works form scintillating poets.

UNIT I (POETRY)

William Wordsworth	- The Tables Turned
Samuel Taylor Coleridge	- Christabel
John Keats	- Ode to a Nightingale

UNIT II (POETRY)

P.B. Shelley	- A Dialogue
Robert Browning	- My Last Duchess
William Blake	- The Lamb/Tiger/London

UNIT III (PROSE)

Addison and Steele	- The Spectator Club
Charles Lamb	- Old China
William Hazlitt	- On going a Journey
Mathew Arnold	-The Study of Poetry

UNIT IV (DRAMA)

Oscar Wilde	-The Importance of Being Ernest
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UNIT V (NOVEL)

Charles Dickens	-The Great Expectations
Thomas Hardy	-Far from the Madding Crowd

URLs:

1. <http://www.poetryfoundation.org/poem/173744>.
2. <http://www.shmoop.com/my-last-duchess/themes.html>
3. <http://www.poetryfoundation.org/learning/essay/237816>
4. <http://www.shmoop.com/great-expectations/summary.html>
5. <http://www.sparknotes.com/lit/maddingcrowd/summary.html>

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN1004	TWENTIETH CENTURY LITERATURE	4	6

OBJECTIVE:

- To make learners how the influence of science and technology rooted in the minds of the writers.
- To make aware of the growth and liberation of human spirit of the time.

UNIT I (POETRY)

T.S. Eliot

-The Waste Land

UNIT II (POETRY)

W.B. Yeats

-Second Coming
Among School Children

G.M. Hopkins

-Wreck of Deutschland

W.H. Auden

-The Shield of Achilles

UNIT III (PROSE)

D.H. Lawrence

-Why the Novel Matters

T.S. Eliot

-Tradition and Individual Talent

UNIT IV (DRAMA)

T.S. Eliot

-Murder in the Cathedral

UNIT V (NOVEL)

Virginia Woolf

-Mrs.Dalloway

D.H. Lawrence

-Sons & Lovers

URLS:

- 1.<http://www.poetryfoundation.org/poem/176735>
2. <http://www.potw.org/archive/potw351.html>
3. https://en.wikipedia.org/wiki/The_Shield_of_Achilles
4. https://en.wikipedia.org/wiki/Tradition_and_the_Individual_Talent
5. <http://study.com/academy/lesson/ts-eliot-s-murder-in-the-cathedral-summary-lesson-quiz.html>

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6ENE101	CREATIVE WRITING	4	6

OBJECTIVE:

- *To teach how to draft, revise and edit the passage.*
- *To compile the journals and magazines*
- *To compose the professional letter.*

UNIT I Creative Writing

Imagination and Writing – Measuring creative writing –
The Importance of Reading

UNIT II The Art of Writing

Tropes and figures – Style and Register – Playing with words

UNIT III Writing Poetry

Definition of Poetry – Dominant modes of poetry – Lyrical, Narrative and Dramatic.

UNIT IV Writing Fiction and Short Stories

Fiction and Non fiction – Literary and popular fiction – Character, Plot, Point of View and Setting in Short Story

UNIT V Writing Drama

Concepts and Characteristics of Drama – Plot, Structure and Characterization

Books for Reference :

Elements of Literature. (Eds.) Scholes et al. (Oxford)

Creative writing. Anjana Neira Dev, Anuradha Marwah, Swathi Pal. Pearson
Longman Publication.

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6ENE102	ENGLISH FOR COMMUNICATION	4	6

OBJECTIVE:

- To teach how pre-read and scan the academic materials to get its meaning.
- To teach the writer's purpose of setting the tone in the context.
- To enable him to synthesize the ideas from what they have comprehended.

UNIT-I

1. The importance of communication
2. Interpersonal communication

UNIT – II

- 1.Body language

UNIT - III

1. Dealing with people
2. Helping people to like you

UNIT -IV

- 1.Meeting
- 2.Preparation
- 3.Content

UNIT - V

1. The Role of Visual Aids
2. Appearance and Attitude
3. Developing Good Habits
4. Giving up Bad Habits
5. Overcoming nervousness and Tension
6. Stage Presentation
7. Audience Oriented Speech

Books for Reference :

DR. K.M.PRABU- “SKILLS FOR COMMUNICATION AND PRESENTATION”

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN2001	ENGLISH LANGUAGE AND LINGUISTICS	5	5

OBJECTIVE:

- *To set an aim to reflect the history of English Language through different periods, an individual's personality through the language development*
- *To enable learners to have deeper understanding in studying the language.*
- *To teach the 44 sounds of 26 English alphabets.*
- *To reflect the current status of English in India.*

UNIT I

English Language

1. The History of English Language
2. The Growth of Vocabulary
3. Standard English
4. English in India

UNIT II

What is studying a language?
What Linguistics isn't
What Linguistics is
Scientific Study of a Language
Linguistics in a historical context

UNIT III

1. Phonetics and Phonology
2. Morphological Structure of Words
3. Syntax – Constituent, Argument and Thematic Structures
4. Semantics and Pragmatics
5. Organs of Speech
6. Intonation, Rhythm and Stress
7. Syllable and its structure
8. Description and classification of consonants and vowels – allophonic variants

UNIT IV

Socio-linguistics

1. What is sociolinguistics?
2. Functions of a language
3. Linguistics versus communicative competence
4. Language and Mind
5. Applied Linguistics

UNIT V

Approaches to Grammar

1. Structural grammar
2. Transformative Generative Grammar
3. Communicative Grammar

Books for Reference :

1. F.T.Wood -“*An Outline History of English Language*”
2. Frank Palmer -“*Grammar*”
3. A C Gimson -“*An Introduction to the Pronunciation of English*”
4. George Yule -“*The Study of Language*”
5. Crystal David -“*Linguistics*”
6. A C Bough -“*A History of English Language*”
7. Andrew Radford, Martin Atkinson and David Britain – “*Linguistics: An Introduction*”, Cambridge University Press
8. Niladri Sekhar Dash – “*Applied Linguistics*”, Heritage Publication
9. RA Hudson -“*Sociolinguistics*”, Cambridge University Press
10. Monica Marquez – “*Methods in Cognitive Linguistics*”, John Benjamins Publishing Company, 2006

SEMESTER II (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN2002	INDIAN LITERATURE IN ENGLISH	5	6

OBJECTIVE:

- *To enhance the learners with early contribution of Indian English Writers.*
- *To introduce the learners the varied range of Indian English writers from R.K.Narayan, Mulk Raj Anand, Raja Rao to Salman Rushdie.*

UNIT I (POETRY)

Nissim Ezekiel - Goodbye Party For Miss Pushpa T.S
Arun Kolatkar - Jejuri

UNIT II (POETRY)

Rabindranath Tagore -Gitanjali

UNIT III (PROSE)

Jawaharlal Nehru -Discovery of India
Sri Aurobindo -The Renaissance in India

UNIT IV (DRAMA)

Girish Karnad - Nagamandala
Manjula Padmanabhan - Harvest

UNIT V (NOVEL)

Sashi Deshpande's -The Dark Holds No Terrors
Kamala Markandaya - A Handful Of Rice

URLs:

1. <http://education.seattlepi.com/main-theme-poem-goodbye-party-miss-pushpa-ts-6614.html>
2. <http://www.sacred-texts.com/hin/tagore/gitnjali.htm>
3. <http://oscareducation.blogspot.in/2013/10/nagamandala-summary.html>
4. <http://ijellh.com/dark-holds-terrors-woman-searching-for-her-identity/>

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN2003	SHAKESPEARE	4	6

Objective:

To introduce learners to 15th Century's social and economy through the works of Shakespeare

UNIT I

The Elizabethan Theatre and Audience
Trends in Shakespeare Studies

UNIT II

A Midsummer Night's Dream

UNIT III

King Lear

UNIT IV

Macbeth

UNIT V

As you like it

URLs:

1. <http://www.theatrehistory.com/british/bellinger001.html>
2. https://en.wikipedia.org/wiki/Shakespeare%27s_reputation
3. <http://www.shakespeare-online.com/plays/kinglear/kinglearps.html>
4. <http://www.cliffsnotes.com/literature/a/as-you-like-it/play-summary>

SEMESTER II (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6EN2004	AMERICAN LITERATURE	4	5

OBJECTIVE:

- *To inculcate students with the major works of American authors and their intellectual philosophies .*
- *To portrait different periods and movements through American Literature.*

UNIT I (POETRY)

Walt Whitman	- 'A Child Said, What The Grass Is?'
Emily Dickinson	- Success is Counted Sweetest
Robert Frost	- Home Burial

UNIT II (POETRY)

E.E.Cummings	- Any one lived in a pretty how town.
Langston Hughes	- I too Sing America
Sylvia Plath	- Daddy

UNIT III (PROSE)

Ralph Waldo Emerson	- The American Scholar
Henry David Thoreau	- Walden

UNIT IV (DRAMA)

Eugene O'Neill	- Mourning Becomes Electra
Morsha Norman	- Night, Mother

UNIT V (NOVEL)

Toni Morrison	-The Bluest Eye
Tennessee Williams	- The Glass Menagerie

URLs:

1. <http://www.gradesaver.com/walt-whitman-poems/study-guide/summary-a-child-said-what-is-the-grass>
2. <http://www.enotes.com/topics/american-scholar>
3. <http://www.biography.com/people/ralph-waldo-emerson-9287153>
4. <http://www.sparknotes.com/lit/menagerie/>

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6ENE201	NEW LITERATURE IN ENGLISH	4	6

Objective:

To introduce students to modern literature & To provide exposure to millennial thinking

UNIT I (POETRY)

Mahmoud Darwish	-Identity Card
Yasmin Farooq	-Is Biology My Destiny?
Czeslaw Milosz	-Incantation

UNIT II (POETRY)

Moniza Alivi	-Thoughts of Pakistani Woman in English Jail
Wislaw Szymborsca	-A Contribution to Statistics
Sathyendra Srivastava	-At an Indian Girl's Third Wedding

UNIT III (PROSE)

Allan Sinfield	-Literature and Cultural Production
Tariq Ali	-Torture Civilizations: Islam and the West

UNIT IV (DRAMA)

Tanika Gupta	-Gladiator Games
Dario Fo	-Accidental Death of an Anarchist

UNIT V (NOVEL)

J.M. Coetzee	-Disgrace
Abdul Razak Gurnah	-Paradise

URLs:

1. <http://www.theparisreview.org/interviews/1721/the-art-of-poetry-no-70-czeslaw-milosz>
2. <http://oberonbooks.com/asian-plays/gladiator-games>
3. [https://en.wikipedia.org/wiki/Paradise_\(Abdulrazak_Gurnah\)](https://en.wikipedia.org/wiki/Paradise_(Abdulrazak_Gurnah))

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6ENE202	BUSINESS WRITING IN ENGLISH	4	6

Objective:

To provide exposure to business writing skills

To introduce them to etiquettes of business communication

Preparation for Writing

UNIT - I

1. Getting Help
2. Layout Guide – E-mails and Letters
3. Dictionary Skills

UNIT - II

1. Steps in Writing
2. Choice of Words
3. Checking Spelling and Grammar

UNIT - III

1. Writing a Plan
2. Referring and Giving News
3. Saying what you can / cannot do and Giving Reasons

Writing Process

UNIT-IV

- 1.Steps to Prepare an Appropriate Reply
 - Understanding the source
 - Preparing Hints
 - Drafting

UNIT – V

1. Mechanics of Writing
 - Framing a Reply
 - Final Steps
 - Checking Reply
 - Polishing and Improving

Books for Reference :

DR. K.M.PRABU- “ADVANCED BUSINESS WRITING”

SYLLABUS
For
B.A.HISTORY
SEMESTERS – III & IV
(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HI3001	HISTORY OF INDIA FROM A.D.1707 TO A.D.1885	5	CC07	5

Objectives

- *To focus on the colonization of India by European Powers.*
- *To highlight on the social reforms introduced during British rule.*
- *To study the evolution of National Movement in India.*
- *To analyse the development of constitutional reforms.*

UNIT - I

Coming of the Europeans – Anglo – French Rivalry – Carnatic Wars – Third Battle of Panipat

UNIT - II

Rise of British Power – Robert Clive – Warren Hastings – Cornwallis – Wellesley

UNIT - III

Hastings – Bentinck – Raja Ram Mohan Roy – Ranjit Singh

UNIT - IV

Dalhousie – Event of 1857 – Factors leading to the formation of Indian National Congress

UNIT - V

Constitutional developments from 1773 to 1861 – Regulating Act, Pitt's India Act, Charter Acts – Queen's Proclamation – Act of 1861

MAPS

1. Portuguese Settlements in India
2. Early English Factories
3. British India under Warren Hastings
4. British India under Wellesley
5. British India under Dalhousie
6. Places connected with the Revolt of 1857

Books for Study:

1. Roy Chaudhry. S. C.: History of Modern India, Surjeet Publications, 2006, New Delhi.
2. Mahajan, V. D.: India since 1526. S. Chand & Co., Pvt. Ltd, 1984. New Delhi - 55
3. Agarwal, R. C.: Constitutional Development and National Movement of India. S. Chand & Co., Pvt., Ltd, 1988 New Delhi.

Books for Reference:

1. Sathianathaier, R. History of India, Vol. I. , S. Viswanathan & Co. (Pvt.) Ltd., 1975, Madras.
2. Jha, D.N., Ancient India, Manohar Publishers, 2004, New Delhi.

SEMESTER III (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HI3002	HISTORY OF TAMIL NADU FROM A.D. 1806 TO A.D.2010	3	CC08	4

Objective:

- *To highlight on the British administration of Tamil Nadu*
- *To evaluate the evolution of National Movement in Tamil Nadu*
- *To study the impact of National Movement in Tamil Nadu*
- *To analyse the progress of Tamil Nadu after Independence.*

UNIT - I

Tamil Nadu in the 19th Century – British Government and Governors – British Administration – Ryotwari System – Society – Economy – Madras University – Railway Line – Socio-Religious Reforms – Literary and Social Organizations.

UNIT - II

Indian National Congress – Swadeshi Movement – Surat Split – V.O. Chidambaram Pillai – Subramania Siva – G. Subramania Iyer – Muslim League – South Indian Liberal Federation – Home Rule Movement.

UNIT - III

Freedom Movement in the Presidency – Dr. P. Varadarajulu Naidu – Thiru. Vi. Ka. – E.V.R. – V.O.C. Pillai – Rajaji – Non-cooperation – Khilafat Movement – Simon Commission Boycott – Justice Govt. under Diarchy – Rajaji as the Premier – Quit India Movement – Indian Independence.

UNIT - IV

Kamaraj Administration – Emergence of Dravidian Movement – Language issue – Price Rise – Development of Industry and Economy – Growth of Education – Death of Nehru – K-plan – Anti-Hindi Agitation – The Election of 1967 – Fall of Congress and Emergence of Dravidian power.

UNIT - V

Tamil Nadu Under Dravidian Parties – Anna – Karunanidhi – MGR – Jayalalitha – MISA – Sri Lankan issue – Kaveri Water Disputes – Coalition politics at the centre – TADA – POTA – Tsunami 2004 – Development of Science, Economy, Education, Medicine, Agriculture and Technology.

Books for Study:

1. Balaji B.S.: Studies in Madras Administration 2 Vols.
2. Balasundram N.: “The Dravidian Movement in Madras” in state politics in India.
3. Subramaniam.N. : History of Tamil Nadu from 1565 to 1965 A.D., Annamalai University, 1948.

Books for Reference:

1. Beaglehole T.H.: Thomas Munroe and the development of administrative policy in Madras.
2. Devanandam. P.D: The Dravida kazhagam, A Revolt against Brahmins.
3. Hardgrave L. Robert: The Dravidian movement – Popular Prakasam, Bombay

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HIAL31	ALLIED-TOURISM IN SOUTH INDIA (EXCLUDING TAMIL NADU)	4	CC09	5

Objective:

- *To focus on the tourism potential in South India*
- *To discuss the cultural aspects of South Indian Tourism*
- *To highlight on the state initiative in developing tourism in South India*

UNIT I

Tourism in South India through the Ages – Famous Pilgrimage Centres – Fairs and Festivals – Art and Craft – Folklore – Cuisine.

UNIT II

Classical Music and Artists of South India – Classical Dances of South India: Kathakali, Kuchipudi, Mohiniattam.

UNIT III

Kerala Tourism Development Corporation – Places of Tourist Interests in Kerala

UNIT IV

Andhra Pradesh Tourism Development Corporation – Places of Tourist Interests in Andhra Pradesh.

UNIT V

Karnataka Tourism Development Corporation – Places of Tourist Interests in Karnataka – Puduchery Tourism Development Corporation and Places of Tourism Interest in Puducherry.

Books for Study:

1. Reddy Ramu, Tourism Industry in Andhra Pradesh, Lap Lambert Academic Publishing, Hyderabad
2. Y. Nirmala Choudhry, Historical and Eco-Tourism: Select Sites in Andhra Pradesh, Ithihasa Prabhasa Publishers, 2007, Hyderabad

Books for Reference:

1. Dominique Sila Khan, Sacred Kerala, A Spiritual Pilgrimage, Penguin Books India Pvt., Ltd., Chennai
2. Karnataka Tourist Map, Stark World Team, Stark World, Bengaluru, 2008.

SEMESTER III (ALLIED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HIAL32	ALLIED-STUDIES ON STATES AND GOVERNMENTS	3	AEC3	4

Objective:

- To identify different forms of governments
- To discuss the various types of Constitutions
- To impart the necessity of separation of Powers
- To analyse the different types of elections

UNIT - I

STATE: Classification of States - Aristotelian Classification - Merits and Demerits of Unitary and Federal States - Problems of Federal Government

UNIT - II

CONSTITUTION: Definition of Constitution - Framework of Government - Rights of the people - Duties of the people - Classification of Constitutions

UNIT - III

THEORY OF SEPARATION OF POWERS: Montesquieu's views on separation of powers -

Its application in the American and British context

UNIT - IV

SUFFRAGE: Meaning of suffrage - Types of Constituency - Duty of representatives - Representation of minorities - Electorate

UNIT – V

POLITICAL PARTIES: Classification of Political parties - Role of Political parties - Defects of Political parties - Interest and Pressure Groups

Books for Study:

1. Amal Roy and Mohit Bhattacharya : Political Theory: Ideas and Institutions, The World Press, Calcutta, 2002
2. A.Appadurai: Substance of Politics: Oxford University Press, New Delhi, 1990
3. C.F.Strong: Modern Political Constitutions, Sidgwick & Jackson Limited, London, 1973.

Books for Reference: 1. Marcidus Roy.C. Contemporary Political ideologies

**IV SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HI4001	HISTORY OF INDIA FROM A.D. 1885 TO A.D.2010	5	CC10	5

Objective:

- *To trace the evolution of National Movement*
- *To identify the different stages of the National Movement*
- *To study the progress of India after Independence*
- *To evaluate the contemporary challenges faced by India*

UNIT - I

Formation of the Congress – Moderate politics, ideology, leadership – Formation of Muslim League – Minto-Morley Reforms – Extremist politics – Partition of Bengal – Swadeshi and Boycott Movement – Extremist leadership

UNIT - II

Lucknow Pact – Montague-Chelmsford Reforms – Rowlatt Act – Jalianwala Bagh Massacre – Khilafat and Non-cooperation Movement – Revolutionary Terrorism – Swarajya Politics – Simon Commission – Nehru Report

UNIT - III

Civil Disobedience Movement – Round Table Conferences – Govt. of India Act 1935 – Concept of Pakistan – Quit India Movement – Cripps Mission – Cabinet Mission Plan – Partition – Indian Independence – Constitution of India – Re-organization of States

UNIT - IV

Nehru Era – Foundations of Foreign Policy – Economic foundations – Indo-China War – Lal Bahadur Shastri – Indo-Pak War – Tashkent Agreement – Indira Gandhi – Indo-Pak War – Emergency years – Janatha Interregnum – Coming back of Indira – Operation Blue Star

UNIT - V

Rajiv Gandhi – Sri Lankan Ethnic Crisis – V.P.Singh – Mandal Commission Report – Narasimha Rao – Economic reforms – Vajpayee – Kargil War – Achievements of Indian Republic – Challenges facing India

Books for Study

1. Raychoudary, S.C.: History of Modern India (1707 to Present day), Surjeet Publication, New Delhi, 2006.
2. Mahajan V.D. and Savithri Mahajan: British Rule in India and After, S. Chand & Co, New Delhi 1969.
3. Bipin Chandra and Others: India after Independence 1947-2000, Penguin Books, New Delhi, 2000.

Books for Reference

1. Grover & Grover: A New outlook on Modern Indian History, S. Chand & Co, New Delhi 2005.
2. Sathianathaier, R.: A History of India Vol.III. S.Vishwanathan & Co, Chennai, 1999.
3. Dr.G.Venkatesan,:A History of Contemporary India, J.J.Publications, Madurai, 2001.

**IV SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HI4002	HISTORY OF MODERN ASIA FROM A.D 1900 TO A.D 2010	3	CC11	4

Objective:

- *To identify the impact of Colonialism in Asian Countries*
- *To analyse the national movements in Asian Countries*
- *To trace the development of Asian Countries after Independence*
- *To highlight on the Contemporary challenges faced by Asian Countries*

UNIT - I

Ceylon - Before Independence - Ethnic Problem - Recent Trends

Pakistan - Creation of Pakistan - Pakistan and her neighbors

UNIT - II

Bangladesh - Formation of Bangladesh - Farakka Barrage - Sheik Haseena

Nepal and Bhutan in the twentieth century

UNIT - III

Malaysia - Nationalism in Malaysia - Tunku Abdul Rahman

Singapore - Birth of Singapore - Economic growth

UNIT - IV

Nationalism in Indonesia - Indo-China - Formation of Vietnam

Laos and Cambodia, Geneva Accord - US in South East Asia

UNIT - V

Philippines; Independence - Relations with United States - Marcos - Aquino

Thailand - Norodom Sihanouk - Tourism Development

Books for Study:

1.N. Jayapalan: History of Modern Asia.

2. B. V. Rao: History of Modern Asia, Sterling Publishers Pvt.Ltd New Delhi.

Books for Reference:

1. Clyde and Beers: The Far East – Prentice Hall of India Ltd, New Delhi – 1976.

2. Harold M.Vinacke: A history of the Far East, Kalyani Publications, New Delhi 1982

3. D. G. E. Hall: History of South East Asia.

**IV SEMESTER
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HIAL41	ALLIED-TOURISM IN TAMIL NADU	4	CC12	5

Objective:

- *To trace the tourism potential of Tamil Nadu*
- *To identify the historical tourism sites of Tamil Nadu*
- *To enlist the natural tourism sites of Tamil Nadu*
- *To evaluate the scope of different types of tourism in Tamil Nadu.*

UNIT - I

Tourism in Tamil Nadu through the Ages – Tamil Nadu Tourism Development Corporation and Its Services in Popularising Tourism in Tamil Nadu

UNIT – II

Historical Monuments – Museums – Temples, Churches, Mosques and Durgahs

UNIT - III

Sanctuaries – National Parks – Hill Stations – Famous Beaches – Resorts

UNIT - IV

Educational Tourism – Medical Tourism – Health Tourism – Adventure Tourism

UNIT - V

Cultural Tourism: Arts and Crafts – Fairs and Festivals – Folklore – Places of Tourist Interest in Vellore District

Books for Study:

G. Shanthi: Folk-Customs in Tamil Nadu, Sharda Publishing House, 2012

Tamil Nadu State Guide Book, TT Maps & Publications Ltd, Chennai

Subash Kulkarni: Discover Tamil Nadu, Media Research & Marketing, New Delhi

Books for Reference:

M.R. Shetty: Tamil Nadu Road Map, Indiana Publishing House, New Delhi

A.V. Shankaranarayana Rao, Temples of Tamil Nadu, Vasana Publications, Chennai

**IV SEMESTER
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE CODE	HRS/ WEEK
U5HIAL42	ALLIED-CONSTITUTION OF INDIA	3	AEC4	4

Objective:

- *To understand the Fundamentals of Indian Constitution*
- *To Know the Rights and Duties of Indian Citizens*
- *To Study the different organs of Indian Government*
- *To evaluate the Local Self Governance in India*

UNIT - I:

INTRODUCTION: Foundations of the Indian Constitution - Salient Features - Preamble - Citizenship Constitutional Amendment in India

UNIT - II:

FUNDAMENTAL RIGHTS AND DIRECTIVE PRINCIPLES OF STATE POLICY:
Nature and scope of Fundamental Rights - Nature and scope of Directive Principles of State Policy

UNIT - III:

UNION GOVERNMENT: The President - The Vice-President - The Prime Minister, Cabinet and Council of Ministers - Lok Sabha - Rajya Sabha - Supreme Court of India - Centre-State Relations

UNIT - IV:

STATE GOVERNMENT: The Governor - The Chief Minister, Cabinet and the Council of Ministers - Legislative Assembly - Legislative Councils - High Courts

UNIT - V:

LOCAL GOVERNMENT:

1. **Urban** Local Government: Corporations - Municipalities - Townships - Cantonments - Mayor
- 74th Constitutional Amendment
2. **Rural** Government: Balvanth Rai Metha Committee - Ashok Metha Committee – District Panchayat - Panchayat Samiti - Village Panchayat - District Collector - 73rd Constitutional Amendment

Books for Study:

1. D. D. Basu: Introduction to Indian Constitution, Prentice Hall, New Delhi, 2005.
2. U.R Ghai: Indian Political System, Academic Publishing House, Jalandhar, 2000.

3. Kishore Sharma: Introduction to the Constitution of India, Prentice Hall of India, New Delhi, 2005.

Books for Reference:

1. Harihara Das: Political System of India, Anmol Publications, New Delhi, 2000.

2. S. R. Maheswari: Local Government in India, Lakshmi Narain Agarwal, Meerut, 2005.

3. J. R. Siwach: Dynamics of Indian Government and Politics, Sterling Publications, New Delhi , 2005.

SYLLABUS
For
M.A.HISTORY
SEMESTERS – I & II
(UNDER CBCS)

2016-2017

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI1001	SOCIAL AND CULTURAL HISTORY OF INDIA UPTO A.D. 1206	5	6

Objectives:

- 1. To study on the sources of Ancient Indian History.*
- 2. To study the Art & Architectural Development in Ancient India*
- 3. To analyse the Social & Cultural condition in Ancient India.*

UNIT – I

Sources of Ancient Indian History – Pre-Historic Culture – The Indus Valley Civilization – Vedic and Later Vedic Culture – Position of Women – Caste System – Religious ferment in the 6th Century B.C. Rise of Jainism and Buddhism – Persian and Greek influences on Indian Society.

UNIT - II

Age of Mauryas – Social Conditions – Literature – Art and Architecture – Indian between 2nd Century B.C to 3rd Century A.D. Brahmanical cultural and synthesis – Social and Economic condition – Mahayana and Hinayana Buddhism – Gandhara and Mathura school of Arts – Vaishnavism and Saivism.

UNIT – III

The Classical Age: Guptas Cultural Florescence – Art and Architecture (Nagara, Vesara and Dravida Style) – Paintings (Ajantha and Ellora Style) – Foreign accounts – The Age of Harsha – Socio, Economic and religious condition – Hiuen Tsang.

UNIT – IV

Advent of the Arabs: Condition of India on the eve of Arab Conquest – Effects of Arab Conquest – Invasions of Mahmud Ghazni and Muhammad Ghori and its effect.

UNIT - V

India between 8th and 12th Century. A.D.: Social and Cultural Conditions – Art and Architecture.

Books for Study

1. Basham,A.L(ed): A cultural History of India, Oxford University Press, New Delhi,2006.
2. Jha,D.N, Ancient India, Manohar Publishers, New Delhi, 2004.
3. Mahajan, V.D, Historyof Delhi Sultanate, Sultan Chand, New Delhi, 2000.

Books for Reference:

1. Chandra Satish,: Medieval India from Sultanate to Mughal, Part-I, 1206 – 1526, Haranand Publications,New Delhi, 1975.
2. Romila Thapar : Ancient Indian Social History, Orient Longman (P) Ltd, New Delhi, 2004.
3. Chandra Satish: Essays on Medieval Indian History, Oxford University Press, New Delhi, 2004.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI1002	SOCIAL AND CULTURAL HISTORY OF TAMIL NADU UP TO A.D.1565	5	6

Objectives:

- 1. To study the social conditions under the Sangam Age.*
- 2. To study the development of Art & Architecture under the Pallvas, Pandyas & Cholas.*
- 3. To study the condition of Tamilnadu under Sultanate of Madurai & Vijayanagaras.*
- 4. To study the economic & religious condition under the Sultanates of Madurai.*

UNIT I

Sangam Age and Post Sangam Age – Social Institutions - Customs and Practices – Economic Life – Trade – Religion – Literature – Arts

UNIT II

Age of the Pallavas – Society Economic life – Religion – Role of the Temples – Literature and Education – Art and Architecture

UNIT III

Age of the Cholas: Society - Economic – Religion – Role of the Temples – Literature and Education – Art and Architecture

UNIT IV

Age of the Pandyas – Society – Economic life – Religion – Foreign Accounts – Literature – Art and Architecture

UNIT V

Tamil Nadu under Sultanate of Madurai and Vijayanagar Empire: Society – Economic life – Religion – Literature – Art and Architecture

Books for Study:

1. Pillay, K.K: A Social History of the Tamils, University of Madras, Madras, 1969.
2. Nambiarooran, K: Tamil Renaissance and the Dravidian Nationalism, Madurai, 1980.
3. Irschick, E.F: Politics and Social Conflict in South India, Oxford University Press, Bombay, 1969.

Books for Reference:

1. Subramanian, N: Social & Cultural History of Tamilnadu (A.D 1336 – A.D.1984) Ennes Publications, Udumalpet, 1999.
2. Sathianathan, S: History of Education in the Madras Presidency, Madras, 1894.
3. Rajaraman, P: The Justice Party, 1916-1937, Poompozhil publishers, Madras, 1988.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI1003	HISTORY OF ANCIENT CIVILIZATIONS	4	6

Objectives:

- 1. To introduce the Origin and the Growth of Pre-Historic Cultures.*
- 2. To study a parallel development of civilizations.*
- 3. To highlight their contributions to the society.*
- 4. To analyze their contributions to the world civilizations.*

UNIT I

Introduction – Definition – Origin and Growth – Pre-Historic Culture – Paleolithic, Mesolithic and Neolithic Period

UNIT II

Egyptian Civilization – Mesopotamian Civilization – Assyrian, Sumerian, Babylonian and Chaldean Civilization

UNIT III

Persian Civilization – Hebrew Civilization

UNIT IV

Ancient Greece – Legacy of Greece – Hellenistic Civilization – Ancient Rome – Roman Civilization

UNIT V

Chinese Civilization – Japanese Civilization – Maya, Aztec and Inca Civilizations

Books for Study:

1. Gokhale, B.K: Introduction to western civilization, S.Chand & Co., New Delhi, 1970.
2. Edward D' Cruz, S.J: A survey of world civilization, Lalvani Publishing House, Bombay, 1970.
3. R.K.Majumdar & A.N.Srivastava: History of World Civilization, SBD Publishers Distributors, New Delhi, 2001.

Books for Reference:

1. Swain, J.E: A History of World Civilization, Eurasia Publishing House Pvt Ltd., New Delhi, 1994.
2. R.D.Goel & I.R.Mehta, Landmarks in the History of World Civilizations, Pitambar Book Depot, New Delhi, 1973.
3. Brinton, Christopher and Wolf: A History of Civilization, Vol.1&2, Printice Hall Inc., USA, 1984.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI1004	ISLAMIC HISTORY FROM A.D. 500 TO A.D.750	4	6

Objectives:

1. To study the condition of pre-Islamic Arabia.
2. To study the teachings of Prophet Mohammed (PBUH).
3. To study the administration of pious caliphate.
4. To study the cultural progress under the Umayyads.

UNIT I

Geography of Arabia - Jahiliya Period – Political, Social, Cultural and Religious Life of the Arabs

UNIT II

Prophet Muhammad – Early Life – Prophethood - Teaching of Islam – Five Pillars of Islam – Quran and Hadith

UNIT III

The Pious Caliphate – Hazrat Abu Bakr, Hazrat Umar, Hazrat Uthman and Hazrat Ali - Their Administration

UNIT IV

The Umayyad Dynasty - Muawiyah I – Yazid I - Abdul Malik – Al Walid I –Umar bin Abdul Aziz – fall of the Umayyads.

UNIT V

Cultural Progress under the Umayyad – Literature - Art and Architecture — Fall of the Umayyads

Books for Study:

1. .Ali, Syed Ameer: The Spirit of Islam, Idaarahi-i-Adabiyat-i-Delhi, New Delhi, 1997.
2. Ali, Syed Ameer: History of the Saracens, Kitab Bhavan, New Delhi, 1995.
3. Abbas: Civilization in Islam, Reference Press, New Delhi, 2005

Books for Reference:

1. Hitti, Philip.K: History of Arabs, Macmillan India, New Delhi,1974
2. Zaydan, Juriji: History of Islamic Civilizations, Kitab Bhawan, New Delhi, 1978
3. Arnold, Thomas: The Legacy of Islam, Oxford University Press, 1980.

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HIE101	TRAVEL AGENCY MANAGEMENT	4	6

Objectives:

- 1. To create an idea about formalities and functions of the Travel Business***
- 2. To know the registration formalities of a Travel Agency from National to International level***
- 3. To know the process of documentations***
- 4. To understand the duties, roles and functions of various Tour operations.***

UNIT – I

Travel Formalities: Passport, Visa, Health Requirements, Taxes, Customs, Currency, Travel Insurance, Baggage and Airport Information

Travel Agency and Tour Operation Business: History, Growth and Present Status of Travel Agency

UNIT – II

Approval of Travel Agents and Tour Operators by Department of Tourism, Government of India – IATA Rules and Regulations for Approval of a Travel Agency, Approval by Airlines and Railways

UNIT – III

Understanding the Functions of a Travel Agency: Travel Information and Counseling to the Tourists, Itinerary Preparation, Reservation, Ticketing, Preparation and Marketing of Tour Packages, Handling Corporate Clients, Conferences and Conventions Sources of Income: Commission, Service Charges

UNIT – IV

Functions of a Tour Operator: Market Research and Tour Package Formulations, Assembling, Processing and Disseminating Information on Destinations, Tour Operation and Post-Tour Management

UNIT – V

Public and Private Sector in Travel Agency Business and Tour Operation Business: ITDC, Travel Corporation of India, TTDC, Cox & Kings, Thomas Cook

Books for Study:

1. Mohinder Chand, Travel Agency Management: An Introductory Text, Anmol Publications Pvt Ltd., New Delhi, 2009
2. L.K.Singh, Management of Travel Agency, Isha Books, Delhi, 2008.
3. Pran Nath Seth, An Introduction to Travel and Tourism, Sterling Publications Pvt Ltd., New Delhi, 2012

Books for Reference:

1. A.K.Bhatia, Tourism Development: Principles and Practice, Sterling Publications Pvt Ltd., New Delhi, 2012.
2. A.M.A, Barkat: Travel and Tourism Management, PHA Learning Pvt Ltd., New Delhi, 2015.
3. A.K.Bhatia: The Business of Travel Agency & Tour Operations Management, Sterling Publications Pvt Ltd., New Delhi, 2012.

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HIE102	FUNDAMENTALS OF DEFENCE AND STRATEGIC STUDIES	4	6

UNIT I

Introduction and conceptual formulations - Introduction of the discipline of Defence and Strategic studies- its subject contents- contemporary relevance and significance – basic concepts of war, battle, campaign etc – Definition of Security, Defence, Strategy and Peace etc.

UNIT II

History of warfare – Historical evolution of warfare – its features and significance – principles of war – causes of war – functions of war – Types of war and scope

UNIT III

Business of International Relations – Nature and Scope of International Relations – features of International Political system – structure of International political system (Uni, Bi & Mult Polar) – Actors in International political system – state and non-state actors; world government (UNO) – Security features in International political system – collective security, balance of power – hegemony, regionalism, etc.

UNIT IV

Introduction to peace – meaning and definition of peace – typology of peace – approaches to peace – disarmament – international law – peace movement – peace research – peace-making - peace building – peace keeping.

UNIT V

Mechanics of peace – role and functions of International Organizations – League of Nations, United Nations Organization – Amicable means to settle inter-state conflicts – Diplomacy scope and function – types of diplomacy – its features

Books for Study:

1. Dr.J.A.Khan, Probing War and Warfare
2. Sadanand R. Patra, Arms Appraisal
3. V.N.Khanna, International Relations, Vol III.

Books for Reference:

1. S.J.R, Bilgrami, International Organizations
2. Bernard,L.L, War and its Causes, New York, Holt, 1946
3. Friedrich,Carl.J, Inevitable Peace, Cambridge Mass, Harvard University Press, 1948

**II SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI2001	SOCIAL AND CULTURAL HISTORY OF INDIA FROM A.D.1206 TO A.D.1857	5	5

Objectives:

- 1. To trace the Social and Cultural interactions and changes in India*
- 2. To focus on the glory of the Indo-Saracenic style of Art & Architecture*
- 3. To know the various religious movements and its impact on Indian social life & thoughts*
- 4. To trace out the implementation and impact of Sultanates, Mughals and European system of Administration in India*

UNIT I

Delhi Sultanate: Social Condition – Status of Women – Religion – Cultural Condition – Literature, Learning, Art and Architecture.

UNIT II

Bhakti Movement: Introduction – Bhakti Cult – Sufi Movement: Introduction – Sufi Orders: Chistiya, Suharwardiya, Qadiriya and Naqshbandiya.

UNIT III

Social and Cultural life under Vijayanagar rule – Art and Architecture – Social and Cultural life under Bahmani Sultans – Art and Architecture

UNIT IV

Sources – India Under Mughals – Social and Cultural Conditions – The Ruling Class – Mansabdars, Jagirdars, Zamindars – Peasants – Status of Women – Religion – Cultural Condition under the Mughals – Literature – Education – Painting – Music – Arts and Architecture.

UNIT V

European Penetration – Growth of Indology – Social and Cultural Policy of the East India Company – Activities of Christian Missionaries – Growth of Humanitarianism – Education in British and Independent India : Traditional Hindu and Muslim Educational System –

Patshalas and Madrasas – Introduction of Western Education – Wood’s Despatch – Universities of 1857.

Books for Study:

1. Mahajan, V.D: History of Delhi Sultanate, Sultan Chand, New Delhi, 2000
2. Chandra, Satish: Medieval India from Sultanate to Mughal – Part-I, 1206-1526, Haranand Publications, New Delhi, 1975
3. J.L.Mehta, Advanced Study in the History of Medieval India, Vol-II (1526 to 1707), Mughal Empire, Sterling Publishers Pvt Ltd., 1984

Books for Reference:

1. Basham, A.L(ed.): A Cultural History of India, Oxford University Press, New Delhi, 2006
2. Bose, M.L: Social and Cultural History of India, Concept Publications, New Delhi, 1989
3. Chandra, Satish: Essays on Medieval Indian History, Oxford University Press, New Delhi, 2004

**II SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI2002	SOCIAL AND CULTURAL HISTORY OF TAMIL NADU FROM A.D1565 TO A.D2000	5	6

Objectives:

- 1. To trace out the Social and Economic changes in Tamil Nadu.*
- 2. To trace the religious and revivalist movements and its impact on Tamil society.*
- 3. To trace the growth and development of Art, Architecture and Literature in Tamil Nadu.*
- 4. To analyze the role of various social movements in the upliftment of women and downtrodden people in Tamil Nadu and its impacts.*

UNIT I

Nayaks of Madurai, Chengi, Tanjore: Society Economic life – Religion – Literature – Art and Architecture.

UNIT II

Tamil Nadu under Carnatic Nawabs and Marathas of Tanjore: Social Condition - Religion – Education - Literature – Art and Architecture – Fine Arts.

UNIT III

Religious developments: Hinduism – Revivalist Movements – Brahma Samaj – Ramakrishna Mission – Theosophical Movement – Saiva Siddhantam – Mutts – Islam : Wahabi Movement – Sufism – Fakirs – Christianity and its Impact.

UNIT IV

Social Reform Movements: Dalit Movement- Pandit C. Iyothee Thasar - Rettamalai Srinivasan – N. Sivaraji Vaikunda Swamy Movement – Indian National Congress and Social Reforms – Self Respect Movement – Women Movements and Social Reforms (1800-2000).

\UNIT V

Growth of Tamil Literature (1800 – 2000) – Prose – Poetry – Novels – Dramas – Journals its Impact on Society – Vethanayagam Pillai – Mu .Varatharajan – Kalki – Jayakanthan – Sujatha – Ka . Na. Subramaniyan – Manavai Mustafa.

Books for Study:

- 1) Balasubramanian C: The status of women in Tamilnadu during the Sangam Age, 1976.
- 2) Devanesan A: History of Tamilnadu, Renu Publications, Marthandam, 1997
- 3) Nagaswamy R: Studies in South Indian History and Culture.

Books for Reference:

- 1) Nilakanta Sastri K.A: The Colas, Vol I, University of Madras, Madras, 1984
- 2) Nilakanda Sastri K.A: The Pandyan Kingdom, London, 1929
- 3) Pillay K.K: Thamizhaga Varalaru Makkalum Panpadum, (in Tamil) International Institute of Tamil Studies, Chennai, 2004.
- 4) Pillay K.K: A Social History of the Tamils, University of Madras, 1975.
- 5) Dr.Minakshi C: Administration and Social life under the Pallavas, University of Madras, Madras, 1977.

**II SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI2003	HISTORY OF MEDIEVAL CIVILIZATIONS	4	6

Objectives:

- 1. To understand the rise and spread of major religions and its impact on social and political life of the people*
- 2. To understand the role of Islam in coordination and consolidation of all sects and tribes beyond the continent.*
- 3. To trace out the endowments of Islam to the World order*
- 4. To trace out the formation, services and impact of Monastic orders in Society*

UNIT I

Rise and Spread of Christianity – The Papacy – Contribution of the Byzantines to World Civilization

UNIT II

Rise and Spread of Islam – Administration under the Pious Caliphate – Contribution of the Saracens to World Civilization

UNIT III

Feudalism – Origin – Feudal Hierarchy – Lord and the Vassal – Knighthood – Merits and Demerits of Feudalism – Crusade – Early Crusades – Later Crusades – Children's Crusade – Causes and Results of Crusades

UNIT IV

Monastic Orders of Medieval Europe – Byzantine Monasticism – Benedictine Monasticism – Franciscans and Dominicans – Monastic Reforms – Medieval Cities – Life, Markets, Guilds, Municipal Services and Crimes

UNIT V

Rise of Medieval Universities – Subjects of Study – Teachers and Students – Life in the Medieval Universities

Books for Study:

1. Gokhale, B.K: Introduction to Western Civilization, S.Chand & Co Pvt Ltd., New Delhi, 1973
2. Judd,G.P: History of Civilization.
3. Wall Bank,T.W: Civilization-Past and Present Balley,N.M

Books for Reference:

1. Toynbee,A.J : A study of History (12 Volumes)
2. Swain,J.E: A Historyof World Civilization, Eurasia Publishing House Pvt Ltd, New Delhi, 1994
3. Will Durant: The Story of Civilization (Vol.I&II)
4. Brinton, Christopher and Wolf: A History of Civilization, Vol. 1 & 2, Prentice Hall Inc., U.S.A, 1984.

**II SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HI2004	ISLAMIC HISTORY FROM A.D. 750 TO A.D.1258	4	5

Objectives:

- 1. To study the origin and the growth of Abbasids*
- 2. To bring out the Glorious past of the Asia under Islamic rulers*
- 3. To understand the contribution of Islamic nations in the field of Intellectual development and progress*
- 4. To bring out the past glory, achievements and contributions of the Islam to the world order.*

UNIT-I

Abbasid Revolution – Abul Abbas Saffah – Abu Jafer Al-Mansur – Harun Al-Rasheed – Mamun Al-Rasheed

UNIT-II

Al-Mutawakkil – Causes for the downfall of the Abbasids – The Crusades – Imaduddin Zengi – Sultan Salahuddin Ayyubi

UNIT-III

The Fatimids of Egypt – Obaidullah Al-Mahdi – Al-Muiz – Al-Aziz – Cultural Contribution of the Fatimids – Downfall of the Fatimids

UNIT-IV

Moors of Spain – Abdul Rahman I – Abdul Rahman II – Abdul Rahman III – Development of Literature, Art and Architecture under the Moors

UNIT-V

Contribution of the Arabs to Science: Medicine, Astronomy, Mathematics, Chemistry and Ophthalmology – Famous Muslim Scientists – Famous Muslim Historians

Books for Study:

1. Abbas: Civilization of Islam, Reference Press, New Delhi, 2005
2. Zaydan, Jurji: History of Islamic Civilization, Kitab Bhavan, New Delhi, 1978
3. Ali, Syed Amir: A Short History of the Saracens, Kitab Bhavan, New Delhi, 1995

Books for Reference:

1. Hitti, Philip K: History of Arabs, Macmillan India, New Delhi, 1974
2. Ali, Syed Ameer: The Spirit of Islam, Idarah-I Adabiyat-I – Delhi, New Delhi, 1997
3. Arnold Thomas: The Legacy of Islam, Oxford University Press, 1980

**II SEMESTER
(COMMON PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HR2001	HUMAN RIGHTS	-	2

Objectives:

- 1. To create an awareness about the evolutionary process of Human Rights Concept*
- 2. To clearly understand the violation of Human Rights and its remedies.*
- 3. To know the necessary laws to protect Human Rights*
- 4. To know and analyse the international covenants to protect the Human rights.*

UNIT I

Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights - Historical Development of Human Rights

UNIT II

International Human Rights - Prescription and Enforcement till World War II - Human Rights and the U.N.O. - Universal Declaration of Human Rights - International Covenant on Civil and Political Rights - International Covenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT III

Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner

UNIT IV

Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts

UNIT V

Contemporary Issues on Human Rights: Children's Rights - Women's Rights-Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment - Fundamental Rights in the Indian Constitution - Directive Principles of State Policy - Fundamental Duties - National Human Rights Commission

Books for Study:

1. Dr.H.O.Agarwal, Human Rights, Central Law Publications, 2014
2. Andrew Clapham, Human Rights: A Very Short Introduction (Very Short Introductions), Oxford University Press, UK, 2007
3. Adil-UI-Yasin, Human Rights, Akansha Publishing, 2006

Books for reference:

1. H.O.Agarwal, A Concise Book on International Law and Human Rights, Central Law Publications, 2014
2. Upendra Baxi, The Future of Human Rights, Oxford University Press, 2012
3. Sharma, Universal Declaration of Human Rights and Indian Law, PHI Learning Pvt Ltd, New Delhi, 2010

**II SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HIE201	HOTEL MANAGEMENT	4	6

Objectives:

- 1. To bring out the importance of Hotel Industry in the Current Scenario of the changing Social orders*
- 2. To understand the Hotel Business in the Current Scenario*
- 3. To give an idea about the various departments and their functions in the Hotel Industry*
- 4. To create an awareness about emerging employment opportunities in the Hotel Industry*

UNIT – I

Classification of Hotels: Different Types of Star Hotels – International Hotel Chains – Indian Hotel Chains – Public and Private Sector Hotels in India – Rules and Regulations Governing Hotel Business in India

UNIT – II

Front Office: Reservation, Concierge, Phone Service, Accounting

UNIT – III

House Keeping: Making Beds, Tidying Rooms, Cleaning and Polishing, Washing and Removing Stains, Vacuuming

UNIT – IV

Food and Beverage Service: Quick Service, Table Service, Specialty Restaurants, Coffee Shops, Buffets and Banquets, Wedding and Birthday Services

UNIT – V

Other Departments of a Hotel: Sales & Marketing Division, Accounting Division, Engineering and Maintenance Division, Security Division, Human Resources Division

Books for Study:

1. Dennis Llicrap and John Cousins, Food and Beverage Service, Book Power, New Delhi, 2008
2. Jatashanker R.Tewari, Hotel Front Office: Operations and Management, Oxford University Press, India, June 2009.
3. V Prakash Kainthola, Principles of Hotel Management, Gyan Books Pvt Ltd., New Delhi, 2006

Books for Reference:

1. G Raghubalan, Smritee Raghubalan, hotel Housekeeping, Oxford University Press, India, July 2009.
2. Jatashanker R Tewari, Hotel Front Office: Operations and Management, Oxford University Press, India, June 2009
3. Gajanan Shirke, Hotel Management, Shroff Publishers & Distributors Pvt Ltd, 2014.

**II SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HIE202	FUNDAMENTAL S OF NATIONAL SECURITY	4	6

Objectives:

To develop a special subject knowledge on the vital concept of National Security – and the approaches to achieve National Security (Special reference to India)

UNIT I

Introduction – Definition, Scope and features of the concept of National Security – Concept of National Power – Elements of National Power (tangible and intangible) – Fundamental factors – values – Goals and policies that determine National Security

UNIT II

Foreign Policy & Defence Policy – Definition, meaning – scope of foreign policy and defence policy – determinants of foreign policy and defence policy – instruments of foreign policy and defence policy – Diplomacy and Defence

UNIT III

Approaches to National Security – Coercive and non-coercive approach – meaning and scope – coercive means – threats – threat perception and defence apparatus – armed forces – its organizations and functions (India) – Non-coercive means – peace mechanics – peace making – peace building

UNIT IV

Strategic environment (India) – Features of Strategic environment – its scope in policy making – India's strategic environment – immediate neighbours – adjacent regions – Indian Ocean and Global Structure – India's Military preparedness – defence budget – force structure and organization

UNIT V

India's strategic relationship (salient features) – India-Pakistan Politics – strategic relations – India-China Politics – strategic relations – India and World Powers.

Books for Study:

1. J.Mani, Anu Ayuthappor (in Tamil), Department of Defence Studies, Voorhees College, Vellore, 2006
2. Shotwell, James T, War as an Instrument of National Policy, New York, Harcourt, Brace, 1929

3. Ropp, Theodore, War in the Modern World, Durham, N.C, Duke University Press, 1959

Books for Reference:

1. Frederick A. Praeger, The State of War: Essays on the Theory and Practice of the International Politics, New York, 1965
2. [Jeffry A. Frieden](#) (Author), [David A. Lake](#) (Author), [Kenneth A. Schultz](#), World Politics: Interests, Interactions, Institutions, W. W. Norton & Company, 2016
3. [Robert J. Art](#) and [Robert Jervis](#), International Politics: Enduring Concepts and Contemporary Issues, Pearson, 2014

SYLLABUS
For
B.B.A

SEMESTERS – III & IV
(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA3001	FINANCIAL ACCOUNTING	5	CC05	5

Objective;

To provide an in-depth understanding of the accounting principles and Financial Statements.

UNIT I

Accounting Concepts – Accounting Conventions – Objectives of Accounting – Rules – Journal – Ledger – Subsidiary Books (purchases book, sales book, purchase return book, sales return book and cash books only)

UNIT II

Trial Balance – Depreciation – need for depreciation –Straight line and Written Down Value Method of Charging depreciation only.

UNIT III

Preparation of trading, profit & loss account and balance sheet.

UNIT IV

Accounting from Incomplete records (Excluding Conversion Method).

UNIT V

Issue of Shares at par –Issue of shares at premium - Issue of shares at discount– Forfeiture of shares - Re-issue of Forfeited Shares.

Proportion of Marks: Problems 80% and Theory 20%

Books for study:

1. **Reddy & Murthy** – Financial Accounting, Margham Publications,2011
2. **R.L.Gupta & V.K. Gupta**- Principles and practice of Accountancy, Sultan Chand & Sons
3. **Grewel T. S** – Introduction to Financial Accounting
4. **Jain S.P** – Introduction to Financial Accounting

Books for Reference:

1. **Gupta R.L and Radhaswamy** –Advanced Accountancy,Sultan Chand & Sons,2003
2. **M.C.Shukla & T.S.Grewal** –Advanced Accountancy, Sultan Chand & Sons

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA3002	PRODUCTION MANAGEMENT	3	CC06	4

Objective:

To make the students understand the decision making process in planning, scheduling and control of production and operation function.

UNIT I

Production — production management – objectives of production management – Functions and scope of production management- production system – Relationship of production with other functional areas.

UNIT II

Production Planning and Control – Routing and Scheduling – Dispatching – Maintenance Management – Types of maintenance – Breakdown – Preventive – Routine.

UNIT III

Plant Location – Introduction – Need for selecting a suitable location – Advantages of Urban, Sub-urban and rural location – Factors influencing plant location.

Plant layout – Objectives – Principles of plant layout – Factors influencing plant layout – Types of Plant layout.

UNIT IV

Work Study – importance of work study – Work Study procedures – Introduction to method study – Objectives of method study – Steps involved in method study.

Work measurement or Time study – Objectives of work measurement – Techniques of work measurement

UNIT V

Quality Control – Importance- Types of inspection – Centralized and Decentralized Inspection – P Chart – X chart - TQM.

Books for study:

1. **Saravanavel P and Sumathi S** – Production and Materials Management ,Margham Publications,2009
2. **Paneerselvam** – Production and Operation Management, Prentice Hall of India,2008
3. **Aswathappa,K**-Production & Operations Management, Himalaya publishing House,2008
4. **Pradeep Kumar & Kedar Nath** –Production Management,Prentice Hall of India

Books for Reference:

1. **Martland T.Telsand**-Production Management, S Chand& Co,2005
2. **Shree Kanungo**:Production and Operation Management, Kalyani Publishers2012
3. **Sharma Gagan Deep, Gurshamji singh, Harpeeth Singh**-Production and operation management,Kalyani Publications,2003

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BAAL31	ALLIED-OPERATIONS RESEARCH	4	EC09	5

Objective:

To make students understand the various tools and techniques like Linear Programming problems, transportation problems, assignment problems, game theory, Job sequencing used in business decision making.

UNIT I

Operations Research – Various models – Applications and Scope – Merits and Demerits. Linear Programming Problem (LPP) – Characteristics – Formulation – Graphical Method of solving LPP – Simple Problems.

UNIT II

Assignment Problems – Transportation Problems – Degeneracy – Methods of finding Initial Basic Feasible Solution – Simple Problems.

UNIT III

Game Theory – Value of Game – Optimum Strategy – With Saddle Point – Without Saddle Point – Dominance Rule – Graphical Method of solving Game – Simple Problems.

UNIT IV

Sequencing Problem – Processing ‘n’ jobs through two machines – Processing ‘n’ jobs through three machines – Replacement Models – Situations – Replacement of items whose efficiency deteriorates with time – Simple Problems.

UNIT V

Networking – Critical Path Method (CPM) – Problem Evaluation and Review Technique (PERT) – Basic differences between PERT and CPM – Construction of Network Diagrams – Rules – Simple Problems.

PROPORTION OF THEORY & PROBLEM: 20:80

Books for study:

1. **Vittal** -Operations Research – Margham Publications.
2. **Anand Sharma**- Operations Research-Himalaya Publishing House,2011

Books for Reference:

1. **J K Sharma** -Operations Research –, MacMillan.

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BAAL32	ALLIED-MANAGERIAL ECONOMICS	3	EC10	4

Objective:

This course is intended to provide a basic foundation on the principles of managerial economics and to demonstrate the application of economic theory to business decisions.

UNIT I

Definition of Economics – Important concept of Economics – Basic Economic Problem – Relationship between Micro and Macro Economics.

Managerial Economics - Nature and Scope of Managerial Economics - Objectives of the Firm.

UNIT II

Theory of Consumer Behaviour – Marginal Utility Analysis- Indifference Curve Analysis.

Meaning of Demand – Law of Demand – Types of Demand – Determinants of Demand – Elasticity of Demand – Demand Forecasting.

UNIT III

Production and Cost Analysis – Law of Returns to Scale and Economies of Scale – Cost Analysis – Different Cost Concepts – Cost and Output Relationship – Short run and Long run Costs - Revenue Curves of Firms – Supply Analysis.

UNIT IV

Market Forms – Market Structure – Basis of Market classification – Perfect Competition – Monopoly – Monopolistic competitions – Duopoly – Oligopoly -Price determination.

UNIT V

Pricing Methods and Strategies – Objectives – Factors – General Considerations – Methods of Pricing – Role of Government – Dual Pricing – Price Discrimination.

Books for study:

- 1.**R.L.Varshney and K.L.Maheshwari**:Managerial Economics, Sultan Chand &Sons,2007
- 2.**R.Veerappan & Saroj Kumar** :Managerial Economics, Thakur Publishers,2013
- 3.**H.L.Ahoja**:Managerial Economics ,S.Chand,2008

Books for Reference:

1. **M.L.Jhingan and J.K.Stephen**, Managerial Economics, Vrinda Publications
2. **Yogesh Maheshwari** –Managerial Economis, Prentice Hall of India.
3. **Dean**- Managerial Economics, Prentice Hall of India

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA3003	STRATEGIC MANAGEMENT	4	CC07	4

Objectives:

To impart knowledge about the importance of strategic management processes.

To focus on how firms formulate, implement and evaluate business strategies.

UNIT I

The business system – objectives of the business – mission – vision- goals – strategic analysis of functional areas – production – marketing – human resources – finance – analyzing corporate capabilities – SWOT.

UNIT II

Corporate strategy – nature and scope – process of strategic planning – formulation of strategy – project life cycle – portfolio analysis – BCG matrix – GE matrix – strategic decision making – business level sub strategies.

UNIT III

Generic strategic alternatives – horizontal, vertical diversification – active and passive alternatives.

UNIT IV

External growth strategy – merger acquisition – amalgamation – joint venture – Strategic organizational structure – line and staff function – evaluation of organizational structure – management of change.

UNIT V

Implementation of strategy – elements of strategy – leadership and organizational climate – planning and control of Implementation.

Books for study:

1. **Dr. C. B. Memoria & Dr. Satish Memoria** - Business planning and policy, Himalaya Publishing House
2. **L.M. Prasad**- Strategic Management, Sultan Chand & Sons

Books for Reference:

- 1.. **S.C. Bhattacharya** - Strategic Management Concepts and Cases, S. Chand & Co
2. **Azhar Kazmi** - - Strategic Management & Business Policy, Tata Mc Graw Hill,2008
3. **Gupta, Gollakote and Srinivasan** – Business Policy and Strategic Managent, Prentice Hall of India, 2005
4. **Saloner and Shepard** – Strategic Managent, John Wiley, 2001
5. **Fred R. David**-Strategic Management and Cases –Prentice Hall of India,2008

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA3004	E- BUSINESS	4	CC08	4

Objective:

To familiarize students about business through internet.

UNIT I: INTRODUCTION

E-Business – Definition & Meaning – Features – Needs – Advantages :- To Consumers – To Business – To Society – To Nation – Limitations – Traditional Vs Electronic Business – E-Business Vs E- Commerce.

UNIT II: E-BUSINESS CATEGORIES

Business to Business – Business to Consumer – Consumer to Business – Consumer to Consumer - Business to Employees – Business to Government – Intra Business.

UNIT III: Electronic Data Interchange (EDI)

Meaning of EDI – Importance – Objectives – Benefits – Process – Types of EDI Files – EDI and Internet.

UNIT IV: NETWORKING

Meaning of Network – Networking – Classifications: – LAN – WAN – MAN- Internet – Meaning – Uses – Applications: – E-Mail – World Wide Web – HTML – HTTP.

UNIT V: E- PAYMENT & E- SECURITY

Meaning of E-Payment – Benefits – Popular Methods – Smart Cards – Advantages – E-Security – Meaning – Security Threats – Security Protection.

Books for study:

1. **Dr K Abirami Devi & Dr M Alagammai** – E-Commerce – Margham Publications.
2. **Dr CS Rayudu** – E-Commerce & E- Business, Himalaya Publishing House
3. **U.S. Pandey, Rahul Srivastava, Saurabh Shukla** – E-Commerce and its Applications, S.Chand & Co, 2007

Books for Reference:

- 1.**P.T.Joseph**, Electronic Commerce – Prentice Hall of India, 2008

SEMESTER III
(SKILL BASED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BASB31	TOTAL QUALITY MANAGEMENT	2	AEC3	4

OBJECTIVE

To acquaint the student with the basic concept of Total Quality from design assurance to service assurance, to give emphasis on International Quality Certification System – ISO 9000.

UNIT I:

Basic concept of Total Quality – Evaluation of TQM – Cost of Quality – Quality Productivity – Components of TQ Loop.

UNIT II:

Conceptual Approach to SQC – Acceptance Sampling and Inspection Plans – Statistical Process Control – Prevention through Process Improvement.

UNIT III:

Process Capability Studies – Humanistic Aspects of TQM – Management of Quality Circle and ZD Programs.

UNIT IV:

Q-7 Tools – Taguchi Loss Function – Failure Analysis – Just In Time (JIT) – JIT Pull System – JIT Purchase.

UNIT V:

Optimum Maintenance Decisions – Total Productive Maintenance - Process Design – Buyer Seller Relations.

Books for study:

1. Subburaj, Total Quality Management– Tata McGraw Hill.
2. Shridhara Bhat, TQM –Himalaya Publications.

Books for Reference:

1. Sandeep Malhotra – Quality Management Planning, Deep and Deep 2006
2. Ansari, A and Modarress – JIT Purchasing, Free Press, New York.

**SEMESTER IV
(COREPAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA4001	MANAGEMENT ACCOUNTING	5	CC09	5

Objective:

To explain the way in which accounting information can be used by the managers in performing their managerial functions of planning and controlling.

UNIT I

Meaning – Definition – Objectives of Management Accounting – Advantages and Limitations of Management Accounting – Differences between Management Accounting and Financial Accounting – Financial Statements – Tools for analysis of financial statement (only Theory).

UNIT II

Ratio Analysis – Meaning- Uses –Limitations of Ratios- Liquidity ratio - Profitability ratio- Turnover ratio -Solvency Ratio.

UNIT III

Fund Flow Analysis – Meaning – Uses- Limitations –Calculation of Fund from operation-Preparation of Schedule of Changes in Working Capital – Preparation of Fund Flow Statement.

Cash Flow Analysis – Meaning – Uses – Limitations –Calculation of Cash from operation –Preparation of Cash Flow Statement.

UNIT IV

Budgetary Control – Meaning – Objectives – Advantages and Limitations of Budgetary Control – Production Budget - Purchase Budget- Flexible Budget -Cash Budget.

UNIT V

Marginal Costing – Uses and Limitations of Marginal Costing –Cost-Volume-Profit (CVP) Analysis –Marginal Cost Equations –Contribution-Break Even Analysis –Profit Volume Ratio-Margin of Safety.

Weight age of Marks: 80% Problems and 20% Theory.

Books for study:

1. Reddy T.S & Hari Prasad Reddy –Management Accounting,Margham Publicationss,2015
2. Maheshwari S.N.—Management Accounting,Sultan Chand & Sons,2008
3. Pillai and Bhagavathi—Management Accounting,S.Chand & Co,2010

Books for Reference:

- 1.M.Y.Khan & P.K.Jain-Management Accounting,Tata Mc Graw Hill,2004
- 2.S.P Gupta, Management Accounting , Sahitha Bhawan, 2007
- 3..Dr.M.Wilson:Management Accounting, Himalaya Publishers,2011

**SEMESTER IV
(COREPAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA4002	MATERIALS MANAGEMENT	3	CC10	4

Objective:

To make the students understand the decision making process in planning , purchasing materials and to understand the inventory control techniques.

UNIT I

Materials – Meaning – Types – Materials Management – Definition and Function – Importance – Integrated Material Management – The Concept – advantages.

UNIT II

Inventory Control – Function of Inventory – Importance – Tools of Inventory Control – ABC – VED – FSN Analysis – EOQ and EBQ . (Only Theory).

UNIT III

Purchase Management – Purchasing Procedure – Dynamic Purchasing – Principles – Import Substitution – International Purchase – Import Procedure.

UNIT IV

Store Keeping – Objectives – Functions and Responsibilities of Store Keeper – Stores Planning – Centralized Store and Decentralized Store– Bin cards – Stock cards- Security Measures – Protection and Prevention of Stores from Fire and other Hazards - Material Handling Equipments.

UNIT V

Vendor Rating –Criteria's –Buyer and Seller Relationship- Guidelines For Improving Buyer and Seller Relationship.

Books for study:

1. Management of System – Gupta & Sharma – MacMillan India Ltd.
2. Materials Management – Varma
3. Production and Material Management- P Sarvanavel and Sumathi

Books for Reference:

1. Gopala Krishnan:Material Management, Prentic Hall of India
2. Dutta: integrated Materials Management
3. England and Leenders: Purchasing and Materials Management

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BAAL41	ALLIED-ORGANISATIONAL BEHAVIOUR	4	EC11	5

Objective:

To describe specific theories related to group, leadership, organizational change and organizational culture which will help students to evaluate methods of motivating and rewarding individuals and group.

Unit-I

Organizational Behavior - Meaning - Importance - Factors Influencing Organizational Behavior - Environmental Factors - Constraints Over Organization and Managerial Performance.

Unit-II

Meaning of Group and Group Dynamics - Reasons for the Formation of Groups - Characteristics of Groups - Types of Groups in Organization - Group Decision Making Process - Small Group Behavior

Unit-III

Leadership Concept - Characteristics - Leadership Effectiveness
Motivation - Importance - Motivators - Financial and Non-Financial - Theories of Motivation.(Maslow's & Herzberg's, McGregor's only)

Unit-IV

Management of Change: Meaning - Importance - Resistance to Change - Causes - Dealing With Resistance To Change - Factors Contributing to Organizational Change - Organizational Development - Meaning and Process.

Unit-V

Organizational Culture - Concept - Distinction between Organizational Culture and Organizational Climate - Factors Influencing Organizational Culture - Morale

Books for study:

1. **Aswathappa .K.** –Organizational Behavior, HPH, Mumbai
2. **J.Jayasankar, S.S.Khanka**- Organizational Behavior, Margham Publications, 2011

Books for Reference:

1. **Rao, VSP and Narayana**-Organizational Theory and Behavior, Konark Publisher (P) Ltd., 1987
2. **LM Prasad** –Organizational Theory and Behavior, Sultan Chand & Sons, 1988
3. **Sekaran Uma**- Organizational Behavior, John Wiley, 2008
4. **Robbins, P.Stephen** –Organizational Behavior-Concepts, Pearson Education, 2008
5. **Luthans Fred**- Organizational Behavior, Mc Graw Hill, 2001

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BAAL42	ALLIED-FINANCIAL MANAGEMENT	3	EC12	4

Objective:

To familiarize oneself with the techniques used in financial management.

UNIT I

Finance – Financial Management – Finance Function – Nature and Scope – Objectives – Interpretation and Analysis of Financial Statements – Tools – Kinds – Limitations – Objectives.

Forecasting – Financial Planning and Control – Factors – Objectives.

UNIT II

Current Assets Management – Components – Cash Management– Receivables Management – Inventory Management –Current Liabilities Management – Components – Size and Sources Working Capital Finance –Factors – Sources – Dangers of inadequacy – Regulations –Tandon Committee – Chore Committee.

UNIT III

Long Term Capital Management – Sources – Shares and Debentures Cost of Capital – Significance – Classifications – Problems in determining – Basic Concepts – Cost of Equity Capital – Methods – Cost of Retained Earnings.

UNIT IV

Capital Structure – Significance – Factors in Capital Structure Decision – Features of Optimum Capital Structure .

Leverage –Meaning -Financial Leverage – Operating Leverage –Composite Leverage-Distinction between Financial Leverage and Operating leverage.

UNIT V

Financial Information System –Meaning - Importance – Features –Components - Functions.

Books for study:

1. **I M Pandey:** Financial Management,Vikas Publishing House,
2. **Prasanna Chandra:** Fundamentals of Financial Management,Tata Mc Graw Hill,2008
3. **S.N.Maheshwari** ,Financial Management,Sultan Chand & Sons,2007

Books for Reference:

1. **Khan & Jain:** Financial Management,Tata Mc Graw Hill, 2008
 2. **P.V.Kulkarni**, Financial Management,Himalaya Publishing House
 3. **S.C.Kuchhal**, Financial Management,Chaitnaya Publishing House.
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**SEMESTER IV
(COREPAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA4003	BUSINESS ENVIRONMENT	4	CC11	4

Objective:

To provide an understanding of the role of business in society and to relate the impact of Environment on Business in an integrative manner.

UNIT I

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 – Government Policy towards Pollution Control – Government and Business relationship in India – Provisions of Indian constitution pertaining to business.

UNIT III

Social Environment – Cultural heritage – Social attitude – Impact of foreign culture, Caste and Communities – Joint Family System – Linguistic and Religious Groups

UNIT IV

Economic Environment – Economic System and their Impact of Business – Macro Economic Parameters like GDP – Population – Urbanization – Per Capita Income and their impact on business decisions.

UNIT V

Financial Environment – Financial System – Commercial Banks – RBI –IDBI –Non-Banking Financial Companies (NBFC).

Books for study:

1. **Dr. Sankaran** : Business Environment, Margham Publishers, 2012
2. **Aswathappa**: Business Environment, Himalaya Publishers
3. **Aswathappa, K**: Legal Environment in Business, Himalaya Publications

Books for Reference:

1. **M. Adhikary** , Economic Environment of Business, Sultan Chand & Sons
2. **Francis Chrunilam**: Business Environment, Himalaya Publications

**SEMESTER IV
(COREPAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BA4004	PRINCIPLES OF INSURANCE	4	CC12	4

Objective:

To understand the role of Insurance sector in the changing environment.

Unit I

Insurance-Meaning- Definition-Features-Functions-Types-Principles-Importance of Insurance to Individual, Business and Society.

Unit II

Life Insurance- Meaning-Definition-Features-Advantages-Distinction between Life Insurance and Non-Life Insurance-Fundamental Principles.

Unit III

Kinds of Life Policies-Individual Plans-Group Plans – Pension Plans- Life Policy Conditions-Settlement of Claims.

Unit IV

Fire Insurance-Meaning-Definition-Features-Scope-Hazards in Fire Insurance-Principles –Kinds of Fire Policies-Procedure for settlement of Fire Claim.

Unit V

Marine Insurance-Meaning-Definition-Types of Marine Insurance-Principles of Marine Insurance-Kinds of Marine Policies-Marine Losses.

Books for study:

1. **A.Murthy**, Elements of Insurance, Margham Publications
2. **R.S.Sharma**, Insurance principles and practices, Vara Publications, 2006
3. **M.N. Mishra and S.B. Mishra**- Principles and practice of insurance, S.Chand & Co

Books for Reference:

1. **A,Murthy**, Risk Management and Insurance, Tata Mc.Graw Hill Publications.

SEMESTER IV
(SKILL BASED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BASBP4	TALLY (PRACTICAL)	2	AEC4	4

1. Create a Company Name
2. How to create a primary group? Explain with your own examples.
3. Create Ledger with your own entries from the books already available.
4. Explain how to create Voucher entries.
5. Explain how to remove Voucher entries.
6. Print the Trial Balance
7. Explain how to create stock category.
8. Explain how to create groups with your own entries.
9. Print Trading Account , Profit and Loss Account and Balance Sheet.
10. Bank Reconciliation Statement.

SYLLABUS
For
B.Com. COMMERCE
SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO3001	CORPORATE ACCOUNTING - I	5	CC05	5

Objective: To give comprehensive understanding of accounting aspects relating to corporate situations / requirements.

Unit – I: Issue of Shares and Debentures

Issue of Shares and Debentures - Various kinds - Forfeiture - Re-issue - Underwriting – Buyback of Shares by the Companies – Employee Stock Option.

Unit – II: Redemption of Preference shares and Debentures

Redemption of Preference Shares and Debentures - Profits Prior to Incorporation.

Unit – III: Final Accounts of Joint Stock Companies

Preparation of Profit and Loss Account – Profit and Loss Appropriation Account and Balance Sheet as per Companies Act 2013 (Managerial Remuneration Excluded).

Unit – IV: Amalgamation, Absorption and External Reconstruction

Amalgamation – Absorption as per Indian Accounting Standards (IAS) 14 (Excluding Intercompany Holdings)

Unit – V: Alteration and Internal Reconstruction of Share Capital

Alteration of Share Capital – Internal Reconstruction and Revaluation of Share Capital.

Note: Weightage of marks: Theory 20% and Problems 80%

Books for Study:

1. **Shukla M.C, Grewal T.S, Gupta S.C**, Advanced Accounts, S. Chand & Co. Ltd., New Delhi.
2. **Reddy T.S & Murthy A**, Corporate Accounting, Margham Publications, Chennai.

Books for Reference:

1. **Jain S.P & Narang K.L**, Advanced Accounting, Kalyani Publishers, Delhi.
2. **Maheshwari S.N. & Maheshwari S.K**, Corporate Accounting, Vikas Publication, New Delhi.
3. **Gupta R.L & Radhaswamy M**, Advanced Accountancy, Sultan Chand & Sons, New Delhi.

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO3002	BUSINESS REGULATORY FRAMEWORK	3	CC06	4

Objective: To enable the students to gain basic knowledge of law relating to Contracts, Agency, Sale of Goods Act and Common Carriage.

Unit –I: Indian Contract Act, 1872

Contract – Meaning – Characteristics – Classification of Contracts - Essential Elements of a valid Contract - Offer – Types – Essentials of valid offer – Essentials of valid acceptance – Revocation of an offer and acceptance – Consideration – meaning – Essentials and legal rules for a valid consideration.

Unit – II: Capacity to Contract

Capacity to Contract – Who are competent and not competent to contract – Minor – Law relating to minor – Persons disqualified by the law – Free consent – Void agreement.

Unit – III: Discharge of contract and Indemnity and Guarantee

Modes of Discharge of contract – Remedies for Breach of Contract - Quasi Contract – Features – Types - Indemnity and Guarantee – meaning – kinds of Guarantee – Rights of Surety – discharge of surety.

Unit – IV: Bailment, Pledge and Contract of Sale of Goods

Bailment – Essentials – Kinds – Duties and rights of Bailor and Bailee – Finder of lost goods – Rights and duties of finder of lost goods – Pledge – Essentials – Rights and duties of Pawnor and Pawnee – Sale of goods Act 1930 – Essential of Contract of Sale – Sale and Agreement to Sell.

Unit – V: Contract of Agency and Carriage of Goods Act

Law of Agency – Essentials of Agency – Kinds of Agent - Irrevocable agent - Duties and Rights of Agent- Duties and Rights of Principal – Termination of Agency – The Carriage of Goods Act – Duties of a Common carrier – Rights – Liability – Common Carrier vs. Private Carrier.

Books for Study:

1. **N.D.Kapoor**, Business law, Sultan Chand & Sons, New Delhi.
2. **R.S.N.Pillai & V.Bagavathi**, Business Law, S.Chand & Co. Ltd., New Delhi.

Books for Reference:

1. **P.Saravanavel and S.Sumathi**, Business Law, Eswar Press, Chennai.
2. **K.R.Bulchandari**, Business Law, Himalaya publishing house, New Delhi.
3. Individual Bare Acts.

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO3003	PRINCIPLES OF MARKETING	4	CC07	4

Objective: To provide insights into the subjects thereby make the students understand about overall aspects of principles of marketing.

Unit - I: Introduction and Concept of Marketing

Meaning and Definition of Market and Marketing – Understanding the market – Functions of Marketing – Classification of Markets – Differences Between Marketing and Selling.

Unit – II: Market Environment and Marketing Segmentation

Marketing Environment – Micro Environment and Macro Environment – Marketing Forecast - Market Segmentation – Concept – Benefits – Bases and Levels.

Unit – III: Consumer Behaviour and Product

Introduction to Consumer Behaviour – Importance of Consumer Behaviour – Factors affecting Consumer Behaviour – Product - Meaning and Concept – Product Life Cycle – Product Mix.

Unit – IV: Pricing and Channels of Distribution

Price – Pricing Policies, Objectives and Methods – Factors to be considered while pricing a product – Channels of Distribution – Major Players in Channels of Distribution – Logistics Management.

Unit – V: Advertising and Sales Promotion

Meaning of Advertising – Importance of Advertising – An overview of various types of Advertising - Ethical Practices in Advertising – Sales Promotion and Personal Selling.

Books for Study:

1. **R.S.N. Pillai & Bagavathi**, Modern Marketing, S. Chand Co. Ltd., New Delhi.
2. **J. Jaysankar**, Marketing, Margham Publications, Chennai.

Books for Reference:

1. **Philip Kotler & Gary Armstrong**, Principles of Marketing, Pearson Education India Limited.
2. **Dr. R.L. Varshney & Dr. S.L. Gupta**, Marketing Management, Sultan Chand & Sons, New Delhi.
3. **J.C. Gandhi**, Marketing Management, Tata Mcgraw Hill, Noida.

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO3004	MODERN BANKING	4	CC08	4

Objective: *To provide the students the latest development in the field of Banking and Financial System.*

Unit- I: Banking

Introduction – Importance of Banking - Banking system in India - Types of Banks - Functions of Commercial Banks – Role of Commercial Banks in Economic Development - All India Development Banks (AIDB).

Unit – II: Bankers and Customers

Definition - Relationship between Banker and Customers – Obligations of a Banker - Negotiable Instruments – Dishonor of a Cheque – Liability of a Paying Banker and Collecting Banker – Banking Ombudsman.

Unit – III: Central Banking System

Central Bank - RBI – Traditional, Promotional and Supervisory Functions – Techniques of Credit Control.

Unit – IV: Recent Trends in Banking

Kiosk Banking - Online banking – transactional and non-transactional applications of online banking – ATM – Services offered at ATMs – CDM – EDI – Benefits of EDI – Cyber cash – Electronic Fund Transfer at Point of Sale – (EFTPOS) – Electronic Payment Services – E-Cheques – ECS (Electronic Clearing System) - RTGS, NEFT, SWIFT - Debit cards, Credit cards and Smart cards.

Unit – V: Technological Developments in Banking

Demat Account –Its Merits and Demerits -E-Commerce in Banking – Hi-tech Banking – Core Banking – Corporate Banking – Merchant Banking – Rural Banking –NRI Banking – Retail Banking -Mobile Banking, Tele-banking.

Books for Study:

1. **B. Santhanam**, Banking and Financial Services, Margham Publications, Chennai.
2. **Prof. D. Mureledharan**, Modern Banking Theory & Practice, Asoke K. Ghosh, PHI Learning Private Limited, New Delhi.

Books for Reference:

1. **K.P.M. Sundaram, E.M. Sundram**, Modern Banking, Sultan Chand & Sons Ltd., New Delhi.
2. **Prof. D. Surya Chandra Rao**, Banking Reforms in India, Regal Publications, New Delhi.
3. **Dr.V.Balu**, Banking and Financial System, Sri Venkateswara Publications, Chennai.

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COAL31	ALLIED-BUSINESS STATISTICS - I	4	EC09	5

Objective: To familiarise students with statistical tools and techniques of data analysis used in business decision making.

Unit I: Introduction to statistics & data collection

Statistics – Meaning - Definition – Functions – Limitations – Scope in business – Stages in a statistical survey – Collection of data – Census and sampling modes of enquiries – Sampling methods – Primary and secondary sources of data – Classification and tabulation of data – Formation of frequency distribution.

Unit II: Data presentation & measures of central value

Graphical and diagrammatic presentation of data using bar diagram, pie diagram, histogram and frequency polygon. Measures of central value – Arithmetic mean - Weighted arithmetic mean – Median– Mode – Geometric Mean – Harmonic Mean.

Unit III: Measures of dispersion and skewness

Measures of Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation - Variance. Measures of Skewness – Karl Pearson's Coefficient of Skewness – Bowley's Coefficient of Skewness. Concept of Kurtosis.

Unit IV: Probability

Probability – Definition - Addition Theorem and Multiplication Theorem (Proof of the theorem excluded) Permutations and Combinations. (simple problems only)

Unit V: Operations Research

Operations Research – Definition – Characteristics – Objectives – Scope – Phases – Models – Linear Programming Problem – Formulation – Solution by Graphic method – Solution by Simplex method (Simple minimization problems only)

Note: Weightage of marks: Theory 30% and Problems 70% (Number of theory questions to be restricted to three sub questions in Part – B and one in Part - C)

Books for Study:

1. **S.P. Gupta, P.K. Gupta and Manmohan**, Business Statistics and Operations Research, Sultan Chand & Sons, New Delhi.
2. **P.R. Vittal**, Business Statistics and Operations Research, Margham Publications, Chennai.

Books for Reference:

1. **S.P. Gupta**, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. **Morris Hamburg**, Statistical Analysis for decision making, Harcourt Trade publishers.
3. **Hamdy A. Taha**, Operations Research: An Introduction, Pearson Education India.

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COAL32	ALLIED-ELEMENTS OF INSURANCE	3	EC10	4

Objective: To make the students understand the importance and benefits of different types of insurance.

Unit – I: Introduction

Insurance – Meaning and definition – Features – Functions – Types of insurance – Insurance vs. Assurance - Fundamental Principles – Advantages of insurance – Role of insurance in economic development – Development of insurance sector in India – Role of private insurance companies – Recent developments – IRDA.

Unit – II: Life Insurance

Life insurance – Meaning and Definition – Features – Objectives – Principles- Non-Life insurance - Individual plan and Group insurance plan – ULIPs - Policy condition and privilege – Lapses and revivals

Unit – III: Fire Insurance

Fire insurance – meaning – Features – Scope – Hazards in fire insurance – Procedure for taking a fire insurance policy – Kinds of fire policies – Surveys and inspection – Reinsurance – Renewals.

Unit – IV: Marine Insurance

Marine insurance – Meaning – Kinds of Marine insurance – Fundamental Principles – Function of Marine Insurance.

Unit – V: Claims

Calculation of Premium for life – Fire and Marine insurances – Motor accident insurance – Surrender value and loans – Claims - Settlements.

Books for Study:

1. **A.Murthy**, Elements of Insurance, Margham Publications, Chennai.
2. **Varma & Agarwal**, Insurance, Forward Publishing Company, New Delhi.

Books for Reference:

1. **M.N.Mishra & S.B. Mishra**, Insurance Principles and Practice, S.Chand & Co Ltd., New Delhi.
2. **P. Periasamy**, Principles and Practice of Insurance, Himalaya publishing house, New Delhi.
3. **Harringtone**, Risk Management & Insurance, Tata McGraw Hill Publishing, New Delhi.

SEMESTER III
(SKILL BASED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COSBP3	INTRODUCTION TO TALLY-PRACTICAL	2	AEC3	4

Objective: To impart basic theoretical and practical knowledge in Accounting using Tally Software.

Unit - I: Introduction to Accounting

Basic Concepts - Accounting Concepts and Accounting Conventions – Accounting Rules - Introduction to Indian Accounting Standards. (Theory Only)

Unit - II: Introduction to Tally

Introduction to Tally – Advantages of Tally Accounting - Salient features of Tally – General Features - Accounting Features – Inventory Features.

Unit – III: Basics in Tally

Creation of a Company – Altering, Deleting and Shutting a Company – Company Information. Introduction to Groups – Sub-Groups – Creation of Groups – Alteration of Groups – Deletion of Groups – Creating, Displaying and Altering Multiple Groups - Process of Creating Ledger – Displaying and Altering Individual and Group Ledgers.

Unit – IV: Journal, Ledger & Trial Balance

Passing Journal Entries in Accounting (Excluding Adjustment Entries) – Preparing Ledger Accounts and Trial Balance. (Theory Only)

Unit – V: Voucher Entry

Introduction to Vouchers –Types of Vouchers - Predefined Vouchers – Creation and Alteration of Vouchers – Cancellation and Deletion of Vouchers (Excluding Inventory Vouchers) - Passing Entries in Tally – Ledger – Trial Balance.

Books for Study:

1. **S. Palanivel**, Tally - Accounting Software, Margham Publications, Chennai.
2. **Asok K Nadhani**, Tally ERP 9 Made Simple: Basic Financial Accounting, BPB Publications, New Delhi.

Books for Reference:

1. **A.K. Nadhani & K.K. Nadhani**, Tally 9, BPB Publications, New Delhi.
2. **Kogent Learning Solutions Inc.**, Tally ERP 9 in Simple Steps, DreamTech Press Inc. New Delhi.
3. **Shraddha Singh, Navneet Mehra**, Tally ERP 9 – Power of Simplicity, V & S Publishers, New Delhi.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO4001	CORPORATE ACCOUNTING - II	5	CC09	5

Objective: To give comprehensive understanding of accounting aspect relating to corporate situations/ requirements.

Unit – I: Valuation of Goodwill and Shares

Valuation of Goodwill – Need and Methods - Average profit, Super profit, Annuity and Capitalization Methods. Valuation of Shares – Need and Methods – Net Assets, Yield and Fair Value Methods.

Unit – II: Liquidation Accounting

Liquidation Accounting – Statement of Affairs and Deficiency Account - Order of Payment – Liquidator's Final Statement of Account.

Unit –III: Accounts of Banking Companies

Accounts of Banking Companies: Rebate on Bill Discounted – Non-Performing Assets (NPA) - Preparation of Profit and Loss Account and Balance Sheet with Relevant Schedules (New Method).

Unit – IV: Accounts of Holding Companies

Accounts of Holding Companies: Minority Interest – Cost of Control – Unrealized Profits – Bonus Shares – Consolidated Balance Sheet (Inter Company Investment excluded)

Unit – V: Accounts of Insurance Companies

Insurance Company Accounts – Accounts of Life Insurance Business – Preparation of Final Accounts – Revenue Accounts – Profit and Loss Accounts – Determination of Net Liability – Accounts of General Insurance Companies – Preparation of Final Accounts.

Note: Weightage of marks: Theory 20% and Problems 80%

Books for Study:

1. Shukla M.C, Grewal T.S, Gupta S.C, Advanced Accounts, S. Chand & Co. Ltd., New Delhi.
2. Reddy T.S & Murthy A, Corporate Accounting, Margham Publications, Chennai.

Books for Reference:

1. Jain S.P & Narang K.L, Advanced Accounting, Kalyani Publishers, Delhi.
2. Maheshwari S.N. & Maheshwari S.K, Corporate Accounting, Vikas Publication, New Delhi.
3. Gupta R.L & Radhaswamy M, Advanced Accountancy, Sultan Chand & Sons, New Delhi.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO4002	COMPANY LAW	3	CC10	4

Objective: To understand the legalistic procedures relevant to formation and running of corporate bodies.

Unit-I: Introduction to The Companies Act, 2013

Company – Definition – Characteristics u/s 2(20) - Kinds of Companies – Distinction between Public Company and Private Company u/s 2(6F) – Conversion of a Private Company into a Public Company and Conversion of a Public Company into a Private Company – Lifting of corporate veil – Company law in a computerised environment - Stages in Formation of a Joint Stock Company. Promoters - Meaning, Kinds, functions, duties and liabilities of promoters.

Unit-II: Memorandum of Association, Articles of Association and Prospectus

Memorandum of Association u/s 2(56) – Meaning – Contents u/s 4 - Alteration - Articles of Association u/s 2(5) – Meaning- Contents u/s 5(3) -Alteration. Prospectus – Meaning and definition-Conditions for the issue of prospectus u/s 2(70) – Statement in lieu of prospectus – Contents of prospectus.

Unit-III: Concept of Capital and Borrowings

Shares u/s 2(84) – Meaning – Types of Shares – Provision for issue of shares – Allotment – Calls – Forfeiture – Alteration of share capital – Debentures – Meaning – Types of Debentures– Bonds – Types of bonds.

Unit-IV: Company Directors and Company Meeting

Directors u/s 2(34) – Women Directors - Qualification and Appointment of Directors u/s 16 – Powers, duties and liability of Director - Removal of Directors – Retirement of Director – Legal Position of a Director- Meeting – Meaning – Essentials of a Valid Meeting – Types of Meeting – Resolution and its Types - Minutes.

Unit-V: Winding up of a Company

Winding Up of a Company u/s 270 – Compulsory Winding Up – Voluntary Winding Up – Winding Up Under the Supervision of the Court.

Books for Study:

N.D.Kapoor, Company Law & Practice, Sultan Chand & Sons, New Delhi.

1. **J. Santhi**, Company law (As per Companies Act, 2013), Margham Publications, Chennai .

Books for Reference:

1. **A.K. Mujumdar**, Dr. D.K. Kapur, Company Law & Practice, Taxmann's, New Delhi.
2. **Vijay Gupta, K.G.Garg**, Company Law, Kalyani Publishers, New Delhi.
3. **P.K.Ghosh, V.Balachandran**, Company Law & Practice, Sultan Chand & Sons, New Delhi.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO4003	MODERN MARKETING	4	CC11	4

Objective: To give an idea of modern marketing which make the students understands marketing in modern scenario.

Unit – I: Introduction to Modern Marketing

Meaning and Concepts - Significance of Modern Marketing – Benefits of Modern Marketing - Various Approaches to Modern Marketing.

Unit – II: Marketing Research

Meaning and Concept of Marketing Research – Steps Involved in Marketing Research – Management Uses of Marketing Research – Challenges to Marketing Research.

Unit – III: Sales Management

Definition and Meaning – Objectives - Sales Research - Sales Forecasting Methods - Sales Planning and Control.

Unit – IV: Branding and Packaging

Meaning and Scope of Branding – Brand Image – Brand Positioning – Trademarks and Copyrights under IPR Act – Packaging - Meaning – Importance – Methods and Trends.

Unit – V: E-Marketing

Introduction, Definition and Objectives of E- Marketing – Features of E- Marketing – E-market vs. Brick and Mortar shops - Types of E-Markets – 4Ps in E-Marketing and E - Customer Relationship Management .

Books for study:

1. **R.S.N.Pillai & Bagavathi**, Modern Marketing, S. Chand & Co. Ltd., New Delhi.
2. **J. Jaysankar**, Marketing, Margham Publications, Chennai

Books for Reference:

1. **Philip Kotler & Gary Armstrong**, Principles of Marketing, Pearson Education India Limited.
2. **Roberto G. Mendia**, Principles of Marketing, Rex Printing Company.
3. **Rajan Nair**, Marketing, Sultan Chand & Sons, New Delhi.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CO4004	BUSINESS ENVIRONMENT	4	CC12	4

Objective: *To enable the students to realise the importance of environment and its impact on business and society.*

Unit- I: Introduction

Business Environment - Types of environment - internal environment - external environment - micro environment - macro environment - competitive structure of industries - competitor analysis – PESTAL analysis.

Unit- II: Economic Environment

Economic Environment - Meaning of Economic System – Characteristics – Functions of an Economic system – Types – Capitalism – Socialism – Mixed – Merits and Demerits.

Unit- III: Social, Cultural & Technological Environment

Social and Cultural Environment – Corporate Governance & CSR – Technological Development and social change – Advantages of Technology – Disadvantages of Technology - Business ethics – code of conduct – Role of Trade Associations in Business Ethics.

Unit- IV: Political Environment

Political environment – Government and legal environment - economic role of government in India; the Constitutional environment.

Unit- V: Global Environment

Global environment – Types of foreign investment – foreign investment in India – Limitations and Dangers of Foreign capital – Factors affecting international Investment – FDI vs. FII - MNC's – Merits and Demerits of MNCs.

Books for study:

1. *S.Sankaran, Business Environment, Margham Publications, Chennai.*
2. *Dr. Francis Cherunilam, Business Environment, Himalaya Publishing House, New Delhi.*

Books for Reference:

1. *K.Aswathappa, Essentials of Business Environment, Himalaya Publishing House, New Delhi.*
2. *Shaikh Saleem, Business Environment, Kindersly India (P) ltd., New Delhi.*
3. *Keith Davis William, C.Frederik, Business and Society, McGraw Hill International Books Co., New Delhi.*

SEMESTER IV (ALLIED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COAL41	ALLIED-BUSINESS STATISTICS - II	4	EC11	5

Objective: To familiarise students with statistical tools and techniques of data analysis used in business decision making.

Unit - I: Correlation & Regression analysis

Correlation – Definition – Uses – Types – Karl Pearson’s Correlation coefficient – Spearman’s Rank Correlation coefficient – Concurrent Deviation method. Regression Analysis – Meaning – Uses – Distinction between Correlation and Regression – Obtaining Regression equations using actual mean method - Concept of Standard Error of estimate.

Unit - II: Index numbers

Index Numbers - Meaning – Uses – Methods of Constructing Index Numbers – Simple Aggregate Method – Simple Average of Relatives Method – Weighted Aggregative Index Numbers – Laspeyres’ Method – Paasche’s Method – Fisher’s Ideal Method – Weighted Average of Relatives method - Time Reversal Test – Factor Reversal Test. Concept (theory only) of Chain Index Numbers, Base Shifting, deflating and Splicing.

Unit - III: Time series analysis

Time Series – Meaning – Utility – Components – Methods of determining trends – Free Hand method – Method of Semi Averages – Method of Moving Averages – Method of Least Squares – Measurement of Seasonal Variations using method of simple averages.

Unit - IV: Introduction to statistical quality control & forecasting

Statistical quality control – Meaning- Need - Advantages – Limitations – Control chart – Meaning – Overview of different types - Acceptance sampling - Meaning–Role. Business forecasting –Meaning – Role – Steps – Overview of methods. (Theory only)

Unit - V: Transportation and Assignment Problems

Transportation Problems – Definition – Obtaining IBFS using North West Corner rule, Least Cost Method and VAM – Unbalanced transportation problems (degeneracy, maximisation and optimality problems excluded). Assignment Problems – Definition – Hungarian Assignment method – Restricted or Prohibited Assignments.

Note: Weightage of marks: Theory 30% and Problems 70% (Number of theory questions to be restricted to three sub questions in Part – B and one in Part - C)

Books for Study:

1. **S.P. Gupta, P.K. Gupta and Manmohan**, Business Statistics and Operations Research, Sultan Chand & Sons, New Delhi.
2. **P.R. Vittal**, Business Statistics and Operations Research, Margham Publications, Chennai.

Books for Reference:

1. **S.P. Gupta**, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. **Morris Hamburg**, Statistical Analysis for decision making, Harcourt Trade publishers.
3. **Hamdy A. Taha**, Operations Research: An Introduction, Pearson Education India.

SEMESTER IV (ALLIED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COAL42	ALLIED-INDIRECT TAXES	3	EC12	4

Objective: *To enable the students to conceptualise the framework of indirect taxation in India.*

Unit – I: Introduction

Introduction: Definition of Tax – Characteristics of Tax – Objectives of Taxation – Canons of Taxation – Indirect Tax – Meaning – Features – Types – Advantages – Disadvantages – Direct Taxes vs. Indirect Taxes – Highlights of Latest Finance Act.

Unit – II: Central Excise Duty

Meaning of Central Excise – Sources of Central Excise Law - Types of Excise Duties – Bases of Excise Duties– Excise Duty vs. Sales Tax – Goods and Excisable goods - Concepts of Manufacture and Manufacturer – Clearance of Excisable Goods – Exemption from Excise Duty – Administrative Setup of Central Excise.

Unit – III: Customs Duty

Meaning of Customs Duty – Types of Customs Duties – Methods of Valuation of Customs – Prohibition of Importation and Exportation of Goods – Exemption from Customs Duty – Clearance of Import / Export Goods – Green Channel vs. Red Channel – Customs Duty Drawback – Meaning – Conditions for Claiming Duty Drawback – Procedure for Claiming Duty Drawback – Officers of Customs – Appointment and Powers – Baggage – Meaning – Import and Export through Courier / Post – Confiscation – Meaning – Confiscation of Improperly Imported Goods.

Unit – IV: Value Added Tax (VAT) and Goods and Services Tax (GST)

Meaning of Value Added Tax (VAT) – Objectives of VAT – Levy of VAT – Types of VAT – Advantages of VAT – Disadvantages of VAT – TNVAT. Meaning of Goods and Services Tax (GST) – Need for GST – GST vs. VAT.

Unit – V: Service Tax

Meaning of Service Tax – Need for Service Tax – Main Features of Service Tax – Applicability and Scope of Service Tax – Taxable Services – Registration under Service Tax– Negative list in Service Tax – Service Tax procedure – Export of Taxable services - Formation and Functions of Director General (Service Tax) [DGST].

Books for Study:

1. **Balachdran V**, Indirect Taxation, Sultan Chand & Sons, New Delhi.
2. **Reddy T S & Hari Prasad Reddy Y**, Business Taxation, Margham Publications, Chennai.

Books for Reference:

1. **Mehrotra H C & Goyal S P**, Indirect Taxes, Sahitya Bhawan Publications, Agra.
2. **Gupta S S**, Service Tax – How to meet your obligations?, Taxmann, New Delhi.
3. **Radha & Parameswaran**, Business Taxation, Prasanna Publication, Chennai.

SEMESTER IV
(SKILL BASED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5COSBP4	TALLY ACCOUNTING-PRACTICAL	2	AEC4	4

Objective: To impart theoretical and practical knowledge in Accounting & Tax using Tally Software.

Unit - I: Final Accounts

Introduction – Preparation of Trading and Profit & Loss a/c – Balance Sheet. (Theory) Final Account in Tally.

Unit - II: Receivables and Payables Management

Introduction – Meaning – Activating Bill Wise Details - Purchase Entries – Sales Entries – Purchase Returns – Sales Returns – Receipt & Payment Entries.

Unit – III: Budgetary Control

Budget – Budgetary Control – Meaning – Creation of Budgets – Group Budgets – Budget Ledgers – Alteration of Budgets – Deletion of Budgets.

Unit – IV: VAT, CST & Service Tax

Introduction to VAT – VAT in India – VAT Documents and Records – Tax Ledger Creation – VAT Composition Reports – VAT Composition – VAT Return Payment. Introduction to CST – CST features in Tally – Payment Entries – Adjustment Entries. Introduction to Service Tax – Taxable Services – Activating Service Tax – Ledger Creation – Payment of Service Tax – Report – Excise Duty – Features – Accounting and Inventory Masters for Excise Duty – Sales Invoice with Excise – Creation of Excise Ledger – Voucher Types – Excise Invoice Printing.

Unit – V: TDS

Introduction – Meaning – Payment – Certificate – Returns – Activating TDS – Ledger Creation – Voucher Entry – Payment Entry – TDS Computation - Report.

Books for Study:

1. **S. Palanivel**, Tally - Accounting Software, Margham Publications, Chennai.
2. **Asok K Nadhani**, Tally ERP 9 Made Simple: Basic Financial Accounting, BPB Publications, New Delhi.

Books for Reference:

1. **A.K. Nadhani & K.K. Nadhani**, Tally 9, BPB Publications, New Delhi.
2. **Kogent Learning Solutions Inc.**, Tally ERP 9 in Simple Steps, DreamTech Press Inc., New Delhi.
3. **Shraddha Singh, Navneet Mehra**, Tally ERP 9 – Power of Simplicity, V & S Publishers, New Delhi.

SYLLABUS
For
M.Com. COMMERCE
SEMESTERS – I & II

(UNDER CBCS)

2016-2017

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO1001	ADVANCED MANAGEMENT ACCOUNTING - I	5	6

Objective: To familiarize the students with Accounting Tools used in Decision Making.

UNIT – I: Management Accounting

Scope and importance – Management Accounting Vs Financial Accounting – Management Accounting as a tool for decision making – Ratio Analysis.

UNIT – II: Decision Making Techniques

Pricing decisions – Cost Volume Profit Analysis – BEP – Margin of Safety – Pricing decisions – Make or buy – Key factor – Selection of suitable Product Mix.

UNIT – III: Funds Flow Statement

Utility and construction of Fund Flow Statement.

UNIT – IV: Cash Flow Statement

Statement as per AS 3 – Utility and construction of Cash Flow Statement – Distinction between fund flow statement and cash flow statement.

UNIT – V: Budget and Budgetary Control

Concept and objectives – Budget administration – Functional budgets – Fixed and flexible budgets – Zero base budget – Performance budget.

Note: Weightage of marks: Theory 20% and Problems 80%

Books for Study:

3. **I M Pandey**, Management Accounting, Vikas Publishing House.
4. **S N Maheswari**, Management Accounting, Sultan Chand & Sons, New Delhi

Books for Reference:

4. **Khan and Jain**, Management Accounting, Tata McGraw Hill, New Delhi
5. **Ravi M Kishore**, Management Accounting, Taxman Publication, New Delhi
6. **Robert S Kaplan and Anthony Atkinson**, Advance Management Accounting , Prentice Hall, New Delhi.

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO1002	MARKETING MANAGEMENT	5	6

Objective: To provide insight into various concepts and tools used in Marketing.

UNIT – I: Marketing

Definition – Scope – Function – New concepts of marketing – Mass marketing – Niche marketing – Strategic marketing – Demarketing – Remarketing – Social marketing – Green marketing – Areas of marketing management.

UNIT – II: Product Planning & Product Life Cycle

Developing a new product – Product line – Factors determining the scope of product line – Challenges in new product development – Product life cycle – Product mix – Classification of goods - Consumer goods - Industrial goods
Branding: Brand Management – Advantages and Disadvantages of branding – Brand management – Packaging and labeling.

UNIT – III: Designing Pricing Strategies

Objectives – Factors affecting pricing decisions – Procedure for price determination – Kinds of pricing – Pricing of a new product – Price differentials – Price leader.

UNIT – IV: Channels of Distribution

Objectives – Functions – Types – Channel management decisions – Evaluating the major channels – Vertical marketing system – Horizontal marketing system – Multi channel system.

UNIT – V: Managing Direct and Online Marketing

Growth of direct marketing – Electronic business – Benefits – Major channels for direct marketing – The online consumer – Online marketing – Advantages and disadvantages – Promises and challenges of online marketing – Ethical issues in direct marketing.

Books for Study:

1. **Ramaswamy V S and Nandakumari S**, Marketing Management, McMillan, Delhi.
2. **Varshney R L and Gupta S L**, Marketing Management, Sultan Chand & Sons., New Delhi.

Books for Reference:

1. **Philip Kotler**, Marketing Management, Prentice Hall of India Pvt. Ltd., New 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.

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO1003	BUSINESS ENVIRONMENT	4	6

Objective: To enable the students to have an overview of various factors influencing business and its prosperity.

UNIT - I: Introduction

Concept of business environment – Nature and significance – Types of environment – Internal, External, Micro and Macro – Dimensions of business environment - Impact of environment on Business and strategic decisions – Challenges - Techniques of environmental analysis and Forecasting.

UNIT - II: Social Environment

Social environment – Objectives and importance- Business and society – Business ethics and Business culture – Social responsibility of business - Responsibilities to different sections – Factors affecting social orientation – Arguments for and against social involvement – Social audit.

UNIT - III: Political and Legal Environment

Political and Government Environment – Political stability – Regulations toward trade, taxation policies – Priorities in social sector.

New industrial policy resolution – Privatization & Disinvestment – Patents and trademarks – Monetary and fiscal policies – Health and safety regulations.

UNIT - IV: Labour Environment

Labour environment – Labour legislations – Labour welfare and social security – Trade unions – Workers Participation in Management – Quality circles.

UNIT - V: Global Environment

Globalization – Impact on Indian business environment – International economic integration – Country evaluation and selection – Foreign entry methods – International trade – Free Trade Vs Protection. GATT and WTO – Origin, objectives organization structure, functioning and its impact on India.

Books for Study:

1. **Francis Cherunilam**, Business Environment, Himalaya Publications, Mumbai.
2. **Sheikh Saleem**, Business Environment, Pearson Education, New Delhi.

Books for Reference:

1. **Suresh Bedi**, Business Environment, Exel, 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..

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO1004	ADVANCED BUSINESS STATISTICS - I	4	6

Objective: To familiarize students with advanced statistical tools and techniques of data analysis in business and research.

UNIT-I: Statistics

Meaning - Definition – Characteristics – Functions and Scope of Statistics. Data: Meaning – Types of data – Primary vs. Secondary data – Sources of primary data and secondary data – Vital statistics.

UNIT-II: Correlation Analysis

Meaning – Uses – Correlation and causation – Types of Correlation – Methods of Correlation – Scatter diagram method – Graphic method – Karl Pearson's co-efficient of correlation – Rank correlation – Concurrent deviation method.

UNIT-III: Regression Analysis

Meaning – Uses – Distinction between Correlation and Regression – Direct method – Actual Mean Method – Assumed mean method – Grouped data.

UNIT-IV: Partial & Multiple Correlation

Characteristics – Uses and Limitations – Multiple Regression Analysis.

UNIT-V: Introduction to Quantitative Techniques

Meaning of Quantitative Techniques – Classification of quantitative techniques – Important operations research techniques – Role of quantitative techniques in business and industry – Limitations of quantitative techniques.

Note: Weightage of Marks - Theory 20% Problem 80%

Books for Study:

1. **Dr. S.P.Gupta**, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. **C.R. Kothari**, Quantitative Techniques, Vikas Publishing House Pvt. Ltd., Noida.

Books for Reference:

1. **Dr. S.P.Gupta, and M.P.Gupta**, Business Statistics, Sultan Chand & Sons, New Delhi.
2. **R.S.N.Pillai and Bhagavathi**, Statistics-Theory & Practice, S.Chand & Co., New Delhi.
3. **P.R.Vittal**, Business Statistics & Operations Research, Margham Publications, Chennai.

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6COE101	BUSINESS & PROFESSIONAL COMMUNICATION	4	6

Objective: *To familiarize students with the principles of Business & Professional Communication and to enhance students' communication and listening skills.*

UNIT - I: Introduction

Communication – Features- Goals of Communication – Forms of Communication – Effective communication – Communication competence – Communication process – Types/Forms of Communication- Communication barriers.

UNIT - II: Communication Technology

Technical communication – Technical reports – Forms – Memos - Technical presentations – e-mails – Graphics – Managing techno life – Changing role of communication technology in workplace – Communication technology and virtual office – Modern communication tools.

UNIT - III: Professional Communication

Meaning – Importance – Oral communication techniques – Public speaking skills – Negotiating skills – Facilitator and participant skills in meetings – Written communication techniques and principles – Reading and comprehension skills – Interpersonal communication- Building interpersonal skills in workplace.

UNIT - IV: Listening

Meaning – Importance of listening – Benefits of effective listening – Hearing versus listening a model for listening – Gender differences and listening – Assessing listening skills – Techniques to make others listen.

UNIT - V: Presentations

Facets of professional presentations – Understanding audience – Speaking occasions – Presentation goals – Selection of best format for presentation Resumes and interviews – Introduction – Employment interview – Surviving the group interview.

Books for Study:

1. **Rajendra Pal & J.S. Korlahalli**, Essentials of Business Communication, Sultan Chand & Sons, New Delhi.
2. **Andrea Rutheford**, Business Communication Skills for Technology, Pearson Educations.

Books for Reference:

1. **Deborah Raach & Elieen Perrigo, Allen & Becon**, Business and Professional Communications for the 21st Century.
2. **J. Penrose**, Advanced Business Communicator, Thomson Asia Ltd.
3. **Guffey, Thomson**, Business Communication.

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6COE102	CORPORATE LAWS	4	6

Objective: To make the students understand the legal framework in connection with the companies.

UNIT –I: Introduction

Corporate Laws Importance – Objectives – Corporate Personality - Competition Act, 2002 – Objectives and Scope – Anti Competitive Agreements – Competition Commission of India – Competition Appellate Tribunal.

UNIT –II: The Consumer Protection Act, 1986

The Consumer Protection Act, 1986 – Objectives – Definition – Consumer Protection Councils – Consumer Dispute Redressal Agencies – Powers – Duties – District Forum – State Commission – National Commission – Appeals – Role of Consumers – Complaint Procedure.

UNIT –III: The Foreign Exchange Management Act, 2000

The Foreign Exchange Management Act, 2000 (FEMA) – Extent and Application – Current Account Transactions – Capital Account Transaction – Export of Goods and Services – Directorate of Enforcement - Powers.

UNIT –IV: The Information Technology Act, 2000

The Information Technology Act, 2000 – Definition u/s 2 – Digital Signature – Legal Recognition of Electronic Records – Controller of Certifying Authorities - Duties of Subscriber of DSC – Cybercrimes – Cyber Appellate Tribunal – Powers – Appeals.

UNIT – V: The Environment Protection Act, 1986

Environment Protection Act, 1986 – Definitions – Objectives – Scope – Powers of Central Government and State Government – Kinds of Pollution – Water & Air - Pollution Control Board – Central & State Constitution and Powers.

Books for Study:

1. **N.D. Kapoor**, Elements of Company Law, Sultan Chand & Sons Ltd. New Delhi.
2. Economic Laws, Taxmann Allied Service (P) Ltd., New Delhi.

Books for Reference:

1. **K.G. Garg, Mukesh Sharma**, et.al., Business and Corporate Law, Kalyani Publishers, New Delhi.
2. **S.S. Gulshan**, A Hand Books of Corporate Laws, S.Chand & Co. New Delhi..
Individual Bare Acts..

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO2001	ADVANCED FINANCIAL MANAGEMENT	5	5

Objective: *To make the students to manage effectively all aspects of finance and investments.*

UNIT – I: Financial Management

Functions and Goals of Financial Management – Maximization vs. Optimization – Risk-return trade-off.

UNIT – II: Fund Management

Long term sources – Shares and Debentures – Convertible securities and term loans – 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: Capital Structure and Leverage

Concepts of cost of capital – Cost of equity, debt, retained earning – Weighted average cost of capital – Capital structure theories – Net income, Net operating income, MM and Traditional Theories. Dividend Policy and Practices – Dividend policies – Factors affecting dividend decisions – Dividend theories – Gordon, Walter and MM theories

UNIT – IV: Working Capital Management

Working capital cycle – Factors influencing working capital - Forecasting of working capital requirements - Management of inventory, cash and accounts receivable – Payables management – Credit and collection policies.

UNIT – V: Management of Fixed Asset

Evaluation of capital investment decision – Payback Period – ARR – IRR – NPV.

Note: Weightage of Marks - Theory 40% Problem 60%

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.

Books for Reference:

1. **S.N. Maheswari**, Fundamentals of Financial Management, Sultan Chand & Sons, New Delhi.
2. **Prasanna Chandra**, Financial Management, Theory and Practice, Tata McGraw Hill Publishing Company, New Delhi.
3. **P.V.Ratnam**, Financial Management Theory, Problems and Solutions, Kitab Mahal, New Delhi.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO2002	HUMAN RESOURCE MANAGEMENT	5	6

Objective: To make the students realize the significance of the Management of Human Resources in an Organisation.

UNIT – I: Human Resource Management

Nature and scope of HRM – Concepts of HRM – Characteristics – Objectives – Importance – Functions – Emerging trends in HRM

UNIT – II: Human Resources Planning

Need and importance of HR planning – HR forecasting – Job analysis – Job description – Job specification.

UNIT – III: Recruitment and Selection

Meaning - Recruitment – Sources of recruitment – Techniques of recruitment – Selection methods - Testing – Interviewing – Placement and Induction.

UNIT – IV: Employees Training

Concepts of training – Need and importance of training – Types of training – Methods and techniques of training – Evaluating effectiveness – Executive Development – Methods and techniques of ED.

UNIT – V: Performance Appraisal

Concepts – Objectives – Importance – Methods of performance appraisal – Traditional and modern methods

Books for Study:

1. **C.B. Gupta**, Human Resource Management, Sultan Chand and Sons, New Delhi.
2. **Dr. K. Sundar & Dr. J. Srinivasan**, Human Resources Management, Vijay Nicole Publishers, Chennai.

Books for Reference:

1. **L.M. Prasad**, Human Resource Management – Sultan Chand and Sons, New Delhi.
2. **P.G. Aquinas**, Human Resources Management Principles and Practices, Vikas Publishers, New Delhi.
3. **David A. Decenzo & S.P. Robbins**, Personal / Human Resource Management, Prentice Hall India, New Delhi.

SEMESTER II (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO2003	FINANCIAL SERVICES	4	6

Objective: To familiarize students with widely used different financial services in the Corporate World.

UNIT – I: Financial Services

Introduction – Concept – Significance – An overview of financial services in India –
Financial services types – Asset based – Fund based – Advisory financial services –
Financial services institutions – NBFC and other players.

UNIT – II: Leasing

Introduction – Concept – Classification – Significance – Limitations – Lease documentations and agreements – Tax aspects of leasing. Hire purchase – Introduction – Concept – Significance – Leasing vs. Hire purchase – Legal frame work – Taxation aspects

UNIT – III: Factoring

Introduction – Concept – Significance – Mechanism – Functions of a Factor – Types – Legal aspect of factoring – Factoring vs. Bill discounting. Forfeiting – Meaning – Salient Features of forfeiting – Advantages – Forfeiting vs. Factoring.

UNIT – IV: Venture Capital

Introduction – Features – Selection of investment – Stages of financing – Evaluation methods – Conventional Method, First Chicago Method and Revenue Multiplier Method – Investment Nurturing – VCI debt instruments – Indian scenario.

UNIT – V: Fee Based & Advisory Financial Services

Introduction – Types – Merchant bankers – Underwriters – Portfolio management – Issue management - Bankers to issue – Book building – Stock broking – Credit rating –
Depository Services.

Books for Study:

1. **M.Y. Khan**, Financial Services, McGraw Hill, New Delhi..
2. **G Ramesh Babu**, Financial Services, Concept Publishing House, New Delhi.

Books for Reference:

1. **B S Bhatia and G S Batra**, Management of Financial Services, Deep & Deep Publications Pvt. Ltd., New Delhi.
2. **Rajesh Khothari**, Financial Service in India, Sage Publications, New Delhi.
3. **Clifford Gomez**, Financial Market, Institution and Financial Services, Prentice Hall, New Delhi.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CO2004	ADVANCED BUSINESS STATISTICS - II	4	5

Objective: To familiarize students with advanced statistical tools and techniques of data analysis in business and research.

UNIT-I: Probability

Addition and multiplication theorem – Conditional probability – Baye's theorem.

UNIT-II: Chi-square Test

Uses – Properties of chi-square test – Procedure for testing the significance of the difference between the observed and expected frequencies – Cautions while applying chi-square test – Hypothesis framing – Hypothesis testing.

UNIT-III: F-test

Properties of F-test – Analysis of variance (ANOVA) – One-way classification – Two-way classification – Testing of hypotheses.

UNIT-IV: Students't-Distribution

Properties of t-distribution – Application of the t-distribution – Cautions while using t-test – Normal curve – Z test – Testing of hypotheses.

UNIT-V: Assignment Problems

Definition – Hungarian assignment method – Restricted or prohibited assignments. Transportation problems: Definition – North West corner rule – Row minima method – Column minima method – Least cost method – Vogel's approximation method – optimality test – Degeneracy in a transportation problem – Unbalanced transportation problem.

Note: Weightage of Marks - Theory 20% Problem 80%

Books for Study:

1. **Dr. S.P.Gupta**, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. **C.R. Kothari**, Quantitative Techniques, Vikas Publishing House Pvt. Ltd., Noida.

Books for Reference:

1. **Dr. S.P.Gupta, and M.P.Gupta**, Business Statistics, Sultan Chand & Sons, New Delhi.
2. **R.S.N.Pillai and Bhagavathi**, Statistics-Theory & Practice, S.Chand & Co., New Delhi.
3. **P.R.Vittal**, Business Statistics & Operations Research, Margham Publications, Chennai.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6HR2001	HUMAN RIGHTS	-	2

Objective: To make the students know the different dimensions in connection with the Human Rights.

UNIT I

Definition of Human Rights – Nature, Content, Legitimacy and Priority – Theories on Human Rights – Historical Development of Human Rights.

UNIT II

International Human Rights – Prescription and Enforcement till World War II – Human Rights and the U.N.O. – Universal Declaration of Human Rights – International Covenant on Civil and Political Rights – International Covenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT III

Human Rights Declarations – U.N. Human Rights Declarations – U.N. Human Commissioner.

UNIT IV

Amnesty International – Human Rights and Helsinki Process – Regional Developments – European Human Rights System – African Human Rights System – International Human Rights in Domestic courts.

UNIT V

Contemporary Issues on Human Rights: Children's Rights – Women's Rights – Dalit's Rights – Bonded Labour and Wages – Refugees – Capital Punishment. Fundamental Rights in the Indian Constitution – Directive Principles of State Policy – Fundamental Duties – National Human Rights Commission.

Books for study:

1. **K. Mohanasundaram**, Human Rights: Theories and Practice, Concept Publishing Company (P) Ltd., New Delhi.
2. **Begum S**, Human Rights in the New Millennium, APH Publishing Corporation, New Delhi.

Books for Reference:

1. **Ram Ahuja**, Social Problems in India, Rawat Publications, Jaipur.
2. **B.Goswami, ed.**, Human Rights and Reforming the Law Raj Publishing House, Jaipur.
3. **Rekha Roy**, Women's Rights in India: A Feminist Perspective, Akasha Publishing House, New Delhi.

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6COE201	CONSUMER BEHAVIOUR	4	6

Objective: To make the students understand the concepts of Consumer and his behaviour at diversified situations.

UNIT – I: Introduction to Consumer Behaviour

Nature and Importance of consumer behaviour – Application of consumer behaviour in marketing – Factors influencing consumer behaviour – Consumer research process.

UNIT – II: Individual Determinants of Consumer Behaviour

Motivation – Needs – Motives and goals – Dynamic nature of motivation – Arousal of motives – Personality – Nature – Theories – Self concept – Psychographic and life style. Perception – Process – Consumer imagery – Perceived risk. Learning – Principles – Theories – Attitude – Structural model of attitude – Attitude formation and change

UNIT – III: Group Determinants of Consumer Behaviour

Reference group influence – Types of consumer relevant groups – Factors affecting group influence – Application of reference group – Concept of Family – Functions of family – Family decision making – Family life cycle – Opinion leadership and personal influence.

UNIT – IV: Environmental Influences on Consumer Behaviour

Social class – Life style profile of social class application to consumer behaviour – Social class mobility. Culture – Meaning - Characteristics – Factors affecting culture – Role of customs – Values and beliefs in consumer behaviour. Sub-culture – Meaning – Sub-culture division and consumption pattern in India – Types of sub-culture – Cross cultural consumer analysis – Similarities and differences among people – Cross-cultural marketing problems in India – Strategies to overcome cross-cultural problems.

UNIT – V: Organisation and Consumers

Factors influencing organisational buying behaviour – Consumer and marketer – Marketing communication and persuasion – Developing persuasive communication – Market regulation – Consumer dissatisfaction.

Books for Study:

3. **Gupta S L**, Consumer Behaviour, Sultan Chand & Sons, New Delhi.
4. **S. Ramesh Kumar**, Consumer Behaviour and Branding, Pearson Education, New Delhi.

Books for Reference:

4. **David L. Loudon and Albert J Della Bitta** , Consumer Behaviour, Tata McGraw Hill, New Delhi.
5. **Leon G . Schiffman and Leslie Lasar Kanuk**, Consumer Behaviour, Pearson Education, India.
6. **Jim Blythe**, Consumer Behaviour, Sage Publication, New Delhi.

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6COE202	E-COMMERCE	4	6

Objective: To familiarize students with the existence and applicability of electronic based Commerce.

Unit - I: Introduction to E-Commerce

Meaning and Definition of E-Commerce – Features of E-Commerce – Advantages and Disadvantages – Issues and Constraints – Traditional Commerce Vs. E-Commerce.

Unit – II: E-Business Models

Introduction to E- Business - E-Commerce Models – Models based on Transaction Types – Brokerage Model, Aggregate Model, Community Model, Manufacturer Model and Marketplace Model (Basic Concepts only).

Unit – III: Electronic Data Interchange

Electronic Data Interchanges (EDI) – Meaning – Benefits of EDI – Process of EDI – Components of EDI – Application of EDI in business.

Unit – IV: E-Marketing & E-CRM

E-Marketing – Meaning – Traditional Marketing vs. E- Marketing – Online Marketing – Pros & Cons of Online Shopping – E- Advertising – E- Branding – Target Markets – Introduction to Customer Relationship Management – E- CRM.

Unit – V: E – Banking & E - Communication

E-Banking – Meaning – Features – Mobile Banking - E-Payment System – Classification of E-Payment System – Risks in E-Payment System. E-Communication – Meaning – Types of E-Communication – E-Mail - Advantages and Disadvantages of E-Mail.

Books for Study:

1. **Elias M. Awad**, Electronic Commerce, Prentice Hall of India, New Delhi.
2. **K. Abirami Devi & Dr. M. Alagammai**, E-Commerce, Margham Publications, Chennai.

Books for Reference:

1. **Gary P.Schneider**, E-Commerce – Strategy, Technology and Implementation, Cengage Learning India Pvt. Ltd., New Delhi.
2. **P.T.Joseph, S.J.**, E- Commerce – An Indian Perspective, Prentice Hall of India, New Delhi. **Greenstein & Merylin**, Electronic Commerce, Tata Mc.Graw

SYLLABUS
For
B.Com. [FINANCE & ACCOUNTS]
SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA3001	CORPORATE ACCOUNTING I	5	CC05	5

Objective:

To gain comprehensive understanding of all aspects relating to corporate accounting and to a theoretical foundation for the preparation of financial statements.

UNIT – I: Issue of shares

Issue of shares – at par, at premium and discount – pro-rata allotment – forfeiture and reissue of shares.

UNIT – II: Issue of debenture

Issue of debentures – redemption of debentures with and without provisions – redemption of preference shares.

UNIT – III: Acquisition of business

Acquisition of business – profit prior to incorporation – final accounts (managerial remuneration excluded).

UNIT – IV: Holding companies

Accounts of holding companies: minority interest – cost of control – unrealized profits – revaluation of assets and liabilities – bonus shares – consolidated balance sheet (inter-company investment excluded).

UNIT – V: Inflation accounting:

Inflation accounting: meaning - limitations of historical accounting – methods of accounting for price level changes – current purchasing power method – current cost accounting method – hybrid method.

Note: Weightage of marks- Problem 80% Theory 20%

Books for Study: Reddy T.S. & Murthy A – Corporate Accounting – Margam Publications, Chennai- 2015

Books for Reference:

1. Shukla M.C., Grewal, T.S. Gupta S.C. – Advanced Accounts – S.Chand & Co. Ltd, New Delhi- 2012
2. Gupta R.L & Radhaswamy M. – Advanced Accountancy, Sultan Chand & Sons, New Delhi-2010
3. Jain & Narang – Advanced Accountancy – Kalyani Publishers, Bangalore, 2006

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA3002	BUSINESS MANAGEMENT	3	CC06	4

Objective:

To gain the knowledge of business management and professionalize students in management.

UNIT- I: Concept of management

Concept of management - meaning and definitions - nature and characteristics of management. Process of management - management vs. administration - levels of management - importance of management and scope of management - principles of management – functions of management (POSDCORB).

UNIT - II: Planning

Planning - its nature, need, characteristics, objectives and importance of planning - types of planning - principles of planning - steps in planning process - planning premises - forecasting - decision making – features, process and importance.

UNIT- III: Organizing

Organizing - principles of organization - authority and responsibility - line and staff organization - functional organization - matrix organization - organization of charts and manual - span of control.

UNIT - IV: Delegation and decentralization

Delegation - meaning - definition of delegation authority - types of delegation - the process or the elements of delegation, assignment of duties, creation of accountability and authority-decentralization - benefits of decentralization- degrees of decentralization.

UNIT - V: Leadership

Leadership - qualities of a good leader - types of leadership - co-ordination and control - problems in co-ordination - steps involved in control process.

Books for study:

1. Jayasankar-Principles of Management, Margham Publication, Chennai-2014

Books for Reference:

1. Dr. C.B Gupta - Business Management, Sultan Chand & Sons, New Delhi-2013
2. Dr.N.Premavathy- Principles of Management, Shri Vishva Publication, Chennai-2008
3. L.M.Prasad- Principles & Practice of Management, Sultan Chand & Sons-New Delhi-1999

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAAL31	ALLIED-BUSINESS STATISTICS – I	4	EC09	5

Objective:

To understand and apply statistics tools in business and economic problems

UNIT – I: Introduction

Origin and growth of statistics – definition - functions and limitations of statistics.

UNIT – II: Collection, classification and tabulation of data

Collection of data – primary and secondary data – classification and tabulation of data.

UNIT – III: Diagrammatic and graphical representation

Diagrammatic and graphical representation of data – bar diagrams – one dimensional and two dimensional diagrams, pictograms and cartograms, frequency distribution.

UNIT – IV: Central tendency

Measures of central tendency – mean, median and mode- geometric mean and harmonic mean – advantages and limitations.

UNIT – V: Measures of dispersion and skewness

Measures of dispersion – range, mean deviation, quartile deviation, standard deviation and Lorenz curve - skewness – Karl Pearson, Bowley's and Kelly's co-efficient of skewness.

Books for Study:

1. R.S.N. Pillai and Bhagavathi: Statistics-Theory & Practice, Sultan Chand & Company, New Delhi- 1999

Reference Books:

1. Dr. S. P. Gupta: Statistical methods, Sultan Chand & Company, New Delhi- 2010.
2. P.R. Vittal- Business Statistics, Margham Publication, Chennai-2015.
3. S.Sankaran: Statistics, Margham Publication, Chennai-2015.

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAAL32	ELEMENTS OF INSURANCE	3	EC10	4

Objective: *Among the non – banking financial companies insurance plays a crucial role. To make the students to understand about the importance of insurance and its role in the development of the society and its constituents*

UNIT - I: Concept of insurance

Definition of insurance - features - function of insurance - primary and secondary - types of insurance - importance of insurance - to individual - to business - to society.

UNIT – II: Principles of insurance

Principle of utmost good faith - insurable interest - indemnity - subrogation - contribution - mitigation of losses - causa proxima - insurance terms - reinsurance - double insurance.

UNIT- III: Life insurance

Meaning - advantages - procedure for effecting life insurance - principles – life policy conditions - difference between assignment and nomination - settlement procedure - maturity claims - survival benefit - death claims.

UNIT - IV: Types of insurance

General insurance - fire insurance - principles - types of fire policies - marine insurance- principles - types of marine policies - miscellaneous insurance policies - motor insurance- third party insurance - fidelity insurance - burglary insurance - credit insurance.

UNIT - V: Recent trends in insurance sector

Insurance industry in India- paradigm shift- insurance sector reforms- global players in the market- entry of banks in to insurance- challenges for insurance sector- insurance regulatory and development authority- objectives- duties and powers- functions- insurance ombudsman.

Books for Study: Murthy. A- Elements of Insurance, Margham Publications, Chennai-2012

Reference Books

1. Murthy .A - Principles & Practice of Insurance, Margham Publications, Chennai- 2013
2. Dr. Premavathy, Principles & Practice of Insurance, Shri Krishana Publication, Chennai-2006
3. Murthy. A- Elements of Insurance, Margham Publications, Chennai-2012

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA3003	BUSINESS ECONOMICS – I	4	CC07	4

Objective:

The syllabus is being designed to familiar the students with various economic concepts and to make him to understand the economics of business influencing the decision making.

UNIT- I: Introduction

Nature, scope, significance, objectives and uses of business economics– difference between economics and business economics – social responsibility of business economics.

UNIT- II: Demand analysis and forecasting

Demand analysis and forecasting– law of demand – demand schedule – demand curve – exceptions to the law of demand – elasticity of demand – importance of elasticity of demand – demand forecasting – types of forecasting – factors involved in demand forecasting- methods of forecasting.

UNIT- III: Cost & revenue analysis

Cost concepts and classifications –different types of costs and their relations to each other – average and marginal cost – various types of revenue curves – short term and long term - diagrammatic representation.

UNIT-IV: Market Structure

Market structure and pricing - pricing under perfect computation - pricing under monopoly - pricing under monopolistic competition – oligopoly features.

UNIT-V: Production function

Production – Production function – iso-quants –producer’s equilibrium – the law of variable proportions – law of returns to scale – economies of scale.

Reference Books:

1. K.P.M Sundaram & E.N. Sundaram - Business Economics, Sultan & Chand, New Delhi.
2. S. Sankaran - Business Economics, Margham Publications, Chennai.
3. Varsheny and Maheshwari - Managerial Economics, Sultan Chand & Co, New Delhi.
4. H.L. Ahuja - Business Economics, S.Chand & Co, New Delhi.

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA3004	MODERN BANKING	4	CC08	4

Objective:

To provide the knowledge and latest developments in the field of banking and financial system to the students.

UNIT – I: Banking & financial system

Brief history of banking - unit banking - branch banking - structure of Indian financial system - mixed banking - functions and importance of commercial banks - credit creation of commercial banks.

UNIT – II: RBI & functions

RBI - functions - instruments of credit control - quantitative and qualitative or selective credit control.

UNIT – III: Nationalisation of commercial banks

Nationalized banks - schedule banks - commercial banks - regional rural banks.

UNIT – IV: Recent developments in banking

Recent Practices - debit card, credit card, ATM and e-banking - electronic fund transfer – electronic clearing system – PIN number.

UNIT – V: Mobile Banking

Meaning – definitions - evolution of mobile banking in the world and in India - types of mobile banking services, services to retail customers, to corporate customers and to bankers – pull and push based mobile banking services – advantages, disadvantages and problems of customers of mobile banking - future prospects of mobile banking in India.

Books for Study:

1. B. Santhanam - Banking and Financial System, Margham Publications, Chennai -2013

Reference Books

1. Dr.V. Balu - Banking and Financial System, Sri Venkateswara Publications, Chennai-2009
2. Dr.S.Gurusamy- Banking Theory Law and Practice, Tata McGraw Hill, New Delhi-2010

**SEMESTER III
(SKILL BASED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FASB31	E-COMMERCE	2	AEC3	4

Objective:- *To impart knowledge on various facts of electronic commerce.*

UNIT- I: Introduction and history of E-commerce

Evolution – meaning - definition of E-commerce - advantages to business

UNIT- II: Scope of E-commerce

Advantages to consumer society and nation – E-commerce – driving forces- internet usage – growth of E-commerce in India.

UNIT- III: Internet and importance application

Tools and application of E-commerce– internet, E-governance, networking, classification – internet of www –intranet & extranet.

UNIT- IV: E-marketing

Online shopping – advantages – disadvantages – advice to the online shopping – E-marketing – E-advertising – E- payment – E-security.

UNIT- V: Cyber crime & law

Cyber crime and cyber law – mobile commerce.

Books for study:

1.Abirami.. Dr Alagammai., E-Commerce, Margham publications, Chennai, 2008

Reference Book :

1. R. Kalakota and A.B. Whinston, Readings in Electronic Commerce, Addison Wesley, 1997
2. David Kosiur, Understanding Electronic Commerce, Microsoft Press, 1997.
3. Soka, From EDI to Electronic Commerce, McGraw Hill, 1995.
4. Sailys Chan, Electronic Commerce Management, John Wiley, 1998.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA4001	CORPORATE ACCOUNTING – II	5	CC09	5

Objective:

To gain accounting knowledge in the Corporate Sector.

UNIT–I: Goodwill and shares

Valuation of goodwill – need – factors affecting the valuation – methods of valuation – average profit, super profit, annuity and capitalization methods. Valuation of shares - need – factors affecting the valuation – methods - net asset, yield and fair value methods.

UNIT – II: Liquidation accounting

Liquidation accounting – order of payment – preferential payments – liquidator final statement of accounts – statement of affair and deficiency accounts.

UNIT – III: Bank account

Bank account: rebate on bills discounted - preparation of profit and loss account and balance sheet with relevant schedules (new method) – non - performing assets (NPA).

UNIT – IV: Amalgamation, absorption and reconstruction

Amalgamation – absorption and external reconstruction of a company (inter-company investment excluded).

UNIT – V: Internal reconstruction

Alteration of share capital – internal reconstruction and revaluation of share capital.

Note: Weightage of marks- Problem 80% Theory 20%

Books for Study:

1. Reddy T.S. & Murthy A – Corporate Accounting – Margam Publications, Chennai- 2015

Reference Book:

1. Shukla M.C., Grewal, T.S. Gupta S.C. – Advanced Accounts – S.Chand & Co. Ltd, New Delhi- 2012
2. Gupta R.L & Radhaswamy M. – Advanced Accountancy, Sultan Chand & Sons, New Delhi-2010
3. Jain & Narang – Advanced Accountancy – Kalyani Publishers, Bangalore-2006

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA4002	BANKING LAW AND PRACTICE	3	CC10	4

Objective:

To gain knowledge on the law and practice of banking.

UNIT- I: Banker- customer relationship

Meaning of Banker and Customer - General relation between Banker and Customer - Debtor and Creditor - Special relationship - Bailor and Bailee - Principal and Agent, Trustee and Beneficiary, Banker and Adviser - Assignor and Assignee - Rights of a Banker - Right to Set-off - Right of Lien.

UNIT - II: Special type of customers

Opening of Bank Account - Types of Accounts– Special Type of Customer - Minor, Club, Societies, Partnership, Joint Stock Companies, Joint Account, Trust, Associations - Closing of a Bank Account - Customer Grievances & Redressal cell – Ombudsman.

UNIT - III: Negotiable instruments

Negotiable instruments - meaning - features - types - cheques, promissory note, bills of exchange - cheques - features of a cheques - specimen of a cheque - material alterations.

UNIT - IV: Crossing and endorsement

Crossing of cheques - meaning - objects - types - general, special and double crossing - endorsement - meaning rules for endorsement - essentials of a valid endorsement - kinds - significance.

UNIT - V: Paying and Collecting Banker

Paying banker - role of paying banker - duties - precautions - statutory protection to the paying banker - refusal of payment of cheques, collection of cheques - collecting banker - precautions - statutory protection given to the collecting banker - negligence - duties and responsibilities of a collecting banker - procedure for collection.

Books for Study:

1. Dr.S.Gurusamy- Banking theory law and practice, Tata Mcgrawhill, New Delhi-2010

Reference Books

1. Dr.V. Balu - Banking and Financial System, Sri Venkateswara Publications, Chennai-2009
2. K.P. Kandasamy, S. Natarajan, R. Parameswaran - Banking Law and Practice, S.Chand&Co -2009

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAAL41	ALLIED-BUSINESS STATISTICS II	4	EC11	5

Objective:

To understand and apply statistics tools in business and economic problems

Unit – I: Sampling methods

Methods of sampling – simple random sampling – stratified random sampling – systematic sampling – methods of economic survey.

Unit – II: Correlation

Simple correlation – Karl Pearson’s co-efficient of correlation – Spearman’s rank correlation (only simple problems).

Unit – III: Regression

Regression – regression equation - regression lines – (only simple problems).

Unit – IV: Index number

Index number – introduction – uses of index numbers – un weighted index number – simple aggregate method and simple average of price relative method – weighted index number – Laspyres, Paasches, Dorbish, Bowly’s, Marshall, Edgeworth and Fisher’s index number – time reversal test (TRT) and factor reversal test (FRT) – consumer price index number (only simple problems).

Unit – V: Time series analysis

Time Series – components of time series – measurement of trends – semi average method - moving average method – method of least square – seasonal indices.

Books for Study:

1. R.S.N. Pillai and Bhagavathi: Statistics Theory & Practice, Sultan Chand & Company, New Delhi- 1999

Reference Books:

1. Dr. S. P. Gupta- Statistical Methods, Sultan Chand & Sons, New Delhi- 2009
2. P.R. Vittal- Business Statistics, Margham Publication, Chennai-2015

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FAAL42	ALLIED-ISLAMIC ECONOMICS	3	EC12	4

Objective:

To define the scope and significance with special reference to the central problems of economics choice. To explain the ethical character of Islamic Economics within the context of the current debate on economic methodology, particularly the Positive / Normative characterization of Islamic Economics.

Unit - I: Introduction

Historical conceptual development and its implication for man and man, man and environment relations – derivation and its implications – freedom of choice with accountability as essential feature of Islamic view of life.

Unit - II: Islamic law and role of state

Islamic view of property as a trust – freedom of enterprises – role of state is ensuring a minimum realization of welfare.

Unit - III: Riba (interest prohibition)

Riba – bank interest and rationale of its prohibition – gharar (hazard) and the prohibition of gambling – competition and co-operation, their relative scopes-risk sharing vs. risk shifting – economic stability and the role of abolition of interest.

Unit - IV: Islamic principle of consumer behaviour

Consumer behaviour self interest with ethical constraints – environmental prospect

Unit - V: Islamic co-operation and zakath

Universal need fulfilment – social solidarity – an economic strength, major goal of public finance in Islam – zakath and share of have-nots in the national product – International Islamic Co-operation.

Reference Books:

1. Dr.Sahabuddin Azami- Islamic Economics, Good Word Book, New Delhi- 2009
2. Habeeb Ahmed Mohammed Sirajul Haque, Hand Books of Islamic Economics, Vol-I- Jeddah-2010.
3. F.R.Faridi- Aspects of Islamic Economics, New Delhi-2002.
4. Syed Afzal Peer Zade- Economics thoughts in Islam- New Century Publication, New Delhi-2014
5. Dr.S.M. Yousuf- Economic justice in Islam, Kithab Bhavan- New Delhi

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA4003	BUSINESS ECONOMICS-II	4	CC11	4

Objective:

To familiar the students with various economic concepts and to make them to understand the economics of business influencing the decision making process.

UNIT- I: Break even analysis

Determination of BEP point – assumptions of break-even analysis – usefulness of break – even analysis – limitations of break – even analysis

UNIT- II: Profit concepts & theories

Accounting profit and economic profit – normal profit and super normal profit – Hawley's risk theory of profit – Knight's uncertainty theory – Clark's dynamic theory – Schumpeter's innovation theory – marginal productivity theory of profit – profit forecasting

UNIT- III: Pricing policy & methods

Pricing Policy – meaning and objectives of pricing policy – factors involved in pricing policy – pricing methods- pricing for public goods.

UNIT – IV Capital budgeting & project profitability

Need for capital – demand for and supply of capital – cost of capital - capital rationing- cost control and reduction – capital budgeting – evaluating investment proposals and project profitability.

UNIT- V: National income & government policies

Government and business - industrial policy - national income competition – concepts of national income – methods of measuring national income - national income in India - contribution.

Books for Study:

1.M.M.Gupta, Business Economics, Sindhu Publication, Bangalore, 2001.

Reference Books:

1. K.P.M Sundaram and E.N. Sundaram - Business Economics, Sultan & Chand, New Delhi,
2. S. Sankaran - Business Economics, Margham Publications, Chennai, 2008.
3. R.L. Varsheny and K.L. Maheshwari - Managerial Economics, Sultan & Chand, New Delhi.
4. H.L. Ahuja - Business Economics, S.Chand &Co., New Delhi.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FA4004	ENTREPRENEURIAL DEVELOPMENT	4	CC12	4

Objective:

To gain knowledge about setting –up and managing a business

UNIT – I: Concepts of entrepreneur

Meaning of entrepreneur – entrepreneur and enterprise – entrepreneur and manager entrepreneur and entrepreneur – qualities [traits] of a true entrepreneur – concepts of entrepreneur – characteristics of entrepreneurship – Schumpeter theory of innovation – McAllen’s achieving society - roles of entrepreneurs in economic development.

UNIT – II: Project preparation

Establishing an enterprise – project identification – selection of product – project formulation – an assessment of project feasibility – preparation of project report – selection of site [location].

UNIT – III: Types of organization

Selection of types of organization – sole proprietorship – partnership joint stock company factors influencing the choice of organization – source of project finance – sources of long term finance – sources of short term finance.

UNIT – IV: Incentives & subsidies

Incentives and subsidies – meaning of incentives and subsidies – need and problems - incentives for development of backward area – incentives for SSI units in backward area – taxation benefits to SSI units subsidies and incentives in Tamil Nadu.

UNIT – V: Women entrepreneur and development

Women entrepreneur – concept – functions and role – problem of women entrepreneur – suggestions for development of women entrepreneurs – rural entrepreneurship – need problems – how to develop rural entrepreneurship.

Reference Books

1. C.B. Gupta – Entrepreneurship Development in India, Sultan Chand & Co, New Delhi-2005
2. Jayashree Suresh – Entrepreneurial Development, Margham Publications, Chennai-2014
3. P.Saravanavel - Entrepreneurial Development, Ess Pee Kay Pub. House, Chennai-1991

**SEMESTER IV
(SKILL BASED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5FASB41	INVESTMENT MANAGEMENT	2	AEC4	4

Objective:

To impart skills on the fundamentals of the investment and securities.

UNIT- I: Nature and scope of investment management

Definition of investment - classification of investment - distinction between investment and speculation – gambling - growing popularity of investments - factors favouring investment.

UNIT- II: Investment objectives

Returns - capital appreciation – safety – liquidity - hedge against inflation - tax planning- features of an investment programme - investment alternatives - tangible – contingent - titular investment.

UNIT- III: Sources of investment

International world affair - domestic, economics and political factors - industry information- company information - security market information - security price quotations - data on related market - data on mutual funds - new investment market - financial information - annual report of companies.

UNIT- IV: Approaches to security analysis

Approaches to security analysis - fundamental analysis - economics analysis - factors affects investments - factors affecting industry growth - industry analysis - company analysis - important approaches to estimate the worth of the security.

UNIT V: Approaches to technical analysis

Approaches to technical analysis – assumptions - difference between technical and fundamental analysis - risk and return analysis – meaning - causes of risk- classification of risk - return on investment - factors determining the return on investment.

References:

1. Dr.Natarajan.L, Investment Management- Margham Publications, Chennai-2014
2. Bhalla, V.K- Investment Management, S.Chand & Co, New Delhi-1999
3. Prasana Chandra- Investment Analysis and Portfolio Management, Tata McGraw Hill,Noida-2009
4. Punithavathy Pandiyan - Security Analysis and Portfolio Management, Vikas Publications-2013

SYLLABUS
For
B.Com. [COMPUTER
APPLICATIONS]

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA3001	CORPORATE ACCOUNTING – I	5	CC05	5

Objective:

To gain comprehensive understanding of all aspects relating to corporate accounting.

UNIT-I

Issue of Shares - at Par, Premium and Discount– Pro-rata Allotment – Forfeiture and Reissue of Shares.

UNIT-II

Redemption of Preference Shares – condition for redemption- preparation of balance sheet after redemption.

Debentures – issue of debentures – redemption of debentures.

UNIT-III

Acquisition of Business –Purchase Consideration-methods of Purchase Consideration – taking over of assets and liabilities except debtors and creditors- Profit prior to Incorporation

UNIT-IV

Final Accounts – Preparation of profit and loss account and balance sheet as per provisions of Companies Act, 2013 (new format) -- calculation of managerial remuneration.

UNIT-V

Liquidation Accounting – Order of payment – Liquidator's Final Statement of Accounts.

(Weightage of Marks – Problems: 80% & Theory: 20%)

Books for study:

1. Reddy T.S. & Murthy A. – Corporate Accounting – Margham Publications, Chennai, 2014
2. Gupta R.L. &Radhaswamy. M – Sultan Chand & Sons, New Delhi, 2013

Reference Books:

1. Jain &Narang – Advanced Accountancy – Kalyani Publishers
2. Shukla M.C.Grewal, T.S.Gupta – Advanced Accounts – S.Chand& Co. Ltd, New Delhi 2014

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA3002	BUSINESS COMMUNICATION	3	CC06	4

OBJECTIVE:

To enable the students identify the role and importance of communication in a manager's job and to draft effective business letters for better communication in organizations.

UNIT - I:

Analysis of Business letters - basic Principles - Drafting - Appearance and Layout - Letter Style.

UNIT - II:

Various types of business letters - Letter of enquiry - Quotations - Offers – Orders-Cancellation- Complaints and Settlement.

UNIT - III:

Circular - Status enquiries - Collection Letters - Application for a situation - Letter of recommendation - Reference Letters.

UNIT - IV:

Company Correspondence - Correspondence with Shareholders, Debenture Holders Fixed Deposit Holders, Government Departments, Statutory Bodies, Office Staff, Customers, Public and Directors.

UNIT-V

Report writing - format - reports - style and language – Reports by individuals and committees - Report on Meetings - Speech writing- role of computer in business correspondence

Books for study:

1. Rajendrapaul & Korlahalli, Business Communication, Sulthan Chand&Sons, New Delhi, 2004
2. K.Sundar & A.Kumara Raj, Business Communication,Vijay Nicole Imprints, Chennai.2013

Books for reference:

1. Shirley Taylor: Communication For Busniess, 2nd Edition, Pearson publishers, New Delhi, 2004
2. Boove, Thilly, : Business communication today person education Pvt Ltd, Schatzmam, New Delhi 2002,

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CAAL31	ALLIED-DATABASE MANAGEMENT SYSTEM	4	EC09	5

Objectives:

To gain basic knowledge of database architecture, models and its applications.

UNIT-I

Introduction to DBMS-Definition of DBMS - Database Architecture and Design – Data Models - E R Model – Mapping Constrains – Keys – ER Diagrams.

UNIT-II

S Q L – Basic Structure – Characteristics of SQL – Data types- Advantage – SQL Operators – Tables- Types of SQL Commands – Data Definition Language- Data Manipulation Language- Transaction Control language.

UNIT-III

SQL functions: Date functions, Numeric functions, string functions, Conversion functions – Aggregate functions - Relational data integrity and database Constraints - Set Operations- Join relations.

UNIT – IV

PL/ SQL Block- PL/SQL Applications - PL/SQL Architecture - PL/SQL data types, variables - Control Structure of PL/SQL – writing simple PL/SQL programs.

UNIT-V

Procedure and Functions – Cursor Management- Triggers – Exception Handling- Writing program using Triggers and Exception Handling.

Books for study:

1. Alexis lean, Mathews Leon, Essential of DBMS, Vijay Nicole .2014
2. Singh-Database systems: Concepts, Design & applications, Pearson Education.2010
3. Abraham Silberschatz, H.F. Korth and S.Sudarshan – Database System Concepts, Mcgraw Hill Publication.2014

Books for reference:

1. Gerald V. Post – DBMS – Designing And Business Applications – Mcgraw Hill Publications.2012
2. Michael Abbey And Michael.J.Corey – Oracle – A Beginners guide – Mcgraw Hill Publications.2012

SEMESTER III
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CAAP31	DATABASE MANAGEMENT SYSTEM (Practical SQL and PL/SQL)	3	EC10	4

Objectives:

To gain practical knowledge of Database Architecture, Models and their applications.

1. The Structure of the Table is given below. Using that structure, create the ‘ emp’ table and insert 15 values in it (use SQL)

Name	Type	Constraint
EMPNO	NUMBER(4)	PRIMARY KEY
ENAME	VARCHAR2(10)	
JOB	VARCHAR2(9)	
MGR	NUMBER(4)	
HIREDATE	DATE	
SAL	NUMBER(7,2)	
COMM	NUMBER(7,2)	
DEPTNO	NUMBER(2)	FOREIGN KEY REFERENCES “dept”

2. Create the ‘dept’ table and insert 5 values in it [using the following structure]

Name	Null?	Type
DEPTNO	NOTNULL	NUMBER(2)
DNAME		VARCHAR2(14)
LOC		VARCHAR2(13)

3. From the above [1 & 2], Execute the following Queries using ‘emp’ and ‘dept’ tables in SQL
 - Display all details of the employees
 - List the entire distinct job in employee
 - Find all the sales people in department 30 whose salary is greater than or equal to 1500
 - Find name, job, salary of employees whose job is manager or salary is greater than or equal to 3000
 - Find the employees earning between 1200 and 1300

- List jobs and departments of employees whose name start with M
 - List the average salary in each dept
 - List the employees whose salary exceeds their manager
4. Create a table client-master with the following fields: client_no, name, address, client_state, pincode, remarks, bal_due with suitable data types.
- Create another table supplier_table from client_master. Select all the fields and rename client_no with supplier_no and name with supplier_name.
 - Insert data into client_master
 - Insert data into supplier_master from client_master.
 - Delete the selected row in the client_master.
5. Create a table sales order with s-order-no and product no as primary key. Some other fields to store client number, delivery address, delivery date, order status.
- Add a new column for storing salesman number using ALTER Command.
 - Set the s_order_no as foreign key as column constraints.
 - Set the s_order_no as foreign key as table constraints.
 - Enforce the integrity rules using CHECK.
6. Create a table student master with the following fields name, regno, dept with suitable data types. Use Select Command to do the following.
- Select the student's name column.
 - Eliminate the duplicate entry in table.
 - Sort the table in alphabetical order.
 - Select all the students of a particular department.
7. Create a table master_book to contain the information of magazine code, magazine name, publisher. Weekly / biweekly / monthly, price. Write PL / SQL block to perform insert, update, delete operations on the above table.
8. Create a table of your own with essential fields and execute the following functions in SQL:
- Any 4 group functions
 - Any 4 numeric functions
 - Any 4 string functions
 - Date functions and conversion functions
9. Create a table to contain phone number, username, address of the phone user. Write a function to search for an address using phone numbers.
10. Create a table to store the details of the Alumnus in an institution. Write a PL/SQL block to change address of particular alumni.

Books for study:

1. Alexis lean, Mathews Leon, Essential of DBMS, Vijay Nicole .2014
2. Singh-Database systems: Concepts, Design & applications, Pearson Education.2010
3. Abraham Silberschatz, H.F. Korth and S.Sudarshan – Database System Concepts, Mcgraw Hill Publication.2014

Books for reference:

1. Gerald V. Post – DBMS – Designing And Business Applications – Mcgraw Hill Publications.2012
2. Michael Abbey And Michael.J.Corey – Oracle – A Beginners guide – Mcgraw Hill Publications.2012

SEMESTER III

(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA3003	COMMERCIAL LAW	4	CC07	4

Objectives:

To give an exposure to the students of some of the important laws, which are essential for the conduct of modern business organization.

UNIT-I

Meaning of law – Sources of law – Indian Contract Act 1872- Classification of Contract on the basis of formation – validity, execution.

UNIT-II

Structure and Formation of Contracts – Essential Element of Contract – Consensus ad idem – Offer and Acceptance – Lawful consideration – Capacity of Parties – Free consent – Mistake – Misrepresentation, Fraud, Coercion and Undue Influence – Lawful Object.

UNIT-III

Contract of Indemnity and Guarantee – Essentials – Differences between contract of Indemnity and contract of Guarantee – Revocation of continuing Guarantee – Surety's liabilities – Rights of Surety – Discharge of Surety from liability – Bailment – Pledge.

UNIT-IV

Contract of Agency – Essentials – Creation of Agency – Kinds of Agent – Agent's Authority – Right and Duties of Principal – Personal Liability of Agent – Delegation of Authority – Sub-Agent – Substituted Agent – Termination of Agency – Irrevocable Agency.

UNIT-V

Sales of Goods Act, 1930 – Conditions and Warranties - Discharge of Contract – Remedies for Breach of Contract – Auction Sale.

Books for study:

1. Mercantile Law – N.D. Kapoor, S.Chand & Co. Ltd, New Delhi 2014
1. Elements of Commercial Law – N.D. Kapoor. S.Chand & Co. Ltd, New Delhi 2012

Books for reference

1. Business Laws – Dr.Srinivasan. Margham Publications, Chennai, 2014
2. Mercantile Law – M.C. Shukla. S.Chand & Co. Ltd, New Delhi 2013

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA3004	STATISTICS I	4	CC08	4

Objectives:

To make the students acquaint with basic concepts and tools of statistics

UNIT-I

Meaning, Scope, functions, uses and limitations of statistics – Primary and Secondary data collection – Questionnaire – Classification and Tabulation – Frequency Distribution.

UNIT-II

Importance and limitations of Diagrams and Graphs – Types – Bar diagrams and pie Diagram – Simple graph, Histogram, Frequency polygon, Frequency curve and Ogive.

UNIT-III

Meaning, Merits and Limitations – Arithmetic Mean, Median, Quartiles, Mode, Geometric Mean and Harmonic Mean.

UNIT-IV

Meaning, Merits and Limitations – Range, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Variation.

UNIT-V

Meaning, Merits and Limitations – Karl Pearson's Coefficient of Skewness – Bowley's Coefficient of Skewness.

Books for study:

1. Fundamentals of Statistics – B. N. Gupta, S.Chand& Co. Ltd, New Delhi 2012
2. Business Statistics – P.R. Vittal, Margham Publications, Chennai, 2014

Books for reference

2. Elements of Statistical Methods – S.P. Gupta, S.Chand& Co. Ltd, New Delhi 2014

**SEMESTER III
(SKILL BASED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CASB31	PRINCIPLES OF INSURANCE	2	AEC3	4

Objectives:

To impart functional knowledge of various types of insurance

UNIT-I

Definition of insurance – classification of Contracts of Insurance – marine and non-marine – General principles of Law as applied to non-marine insurance.

UNIT-II

Life Assurance – objects and Principles of life Assurance – different plans of life Assurance and annuities – policy condition and privilege – assignment and nomination – Lapses and revivals – surrender values and loans – claims – double insurance.

UNIT-III

Marine insurance – principles and functions of marine insurance – functions of marine insurance – proximate clause – subrogation – contribution- warranties – kinds of marine losses – reinsurance and double insurance.

UNIT-IV

General Insurance –Types of General Insurance –Medical Insurance-Vehicle Insurance-Burglary insurance – Livestock & Cattle Insurance - Crop Insurance –Procedure for Claims.

UNIT-V

Fire insurance – principles of law as applied to fire insurance – the subject matter of fire insurance – fire waste – hazard types of fire policy – cover notes – surveys and inspection average – re-insurance – renewals.

Books for study:

1. A. Murthy – Elements of Insurance . Margham Publications, Chennai, 2014
2. Dr. B. Vardharajan – Insurance Vol 1 and 2 – Margham Publications, Chennai, 2014

Books for reference:

3. R.S. Sharma – Insurance Principles & Practice – GK Books. Bombay, 2006.
4. Risk Management & Insurance – Harrington, – Tata McGraw Hill publications. 2006

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA4001	CORPORATE ACCOUNTING – II	5	CC09	5

Objective:

To gain comprehensive understanding of all aspects relating to Amalgamation, Merger and knowledge of banking companies & inflation accounting.

UNIT-I

Valuation of Goodwill – Need – Factors affecting the Valuation – Methods of valuation – Valuation of Shares: Need – Factors affecting the valuation – Net Asset, Yield and Fair Value Methods.

UNIT-II

Accounts of Holding Companies – Minority Interest – Cost of Control – Consolidated Balance Sheet.

UNIT-III

Amalgamation, Absorption and Reconstruction – method of calculation of purchase consideration- Capital Reduction – Conditions for Capital Reduction – Preparation of balance sheet after reduction.

UNIT-IV

Bank Accounts: Rebate on Bills Discounted, Interest on Doubtful Debts, Preparation of Profit and Loss Account and Balance Sheet with Relevant Schedules (New format) – Non-Performing Assets (NPA).

UNIT-V

Inflation Accounting (Accounting for price level changes) – Limitations of Historical Accounting – Current Purchasing Power Method – Current Cost Accounting Method – Hybrid Method – Preparation of Income statement – Profit and Loss Account and Balance sheet.

(Weightage of Marks, Problems: 80% and Theory: 20%)

Books for study:

3. Reddy T.S. & Murthy A. – Corporate Accounting – Margham Publications, Chennai, 2014
4. Gupta R.L. & Radhaswamy. M – Sultan Chand & Sons, New Delhi, 2013

Reference Books:

3. Jain & Narang – Advanced Accountancy – Kalyani Publishers
4. Shukla M.C. Grewal, T.S. Gupta – Advanced Accounts – S.Chand & Co. Ltd, New Delhi 2014

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA4002	MARKETING MANAGEMENT	3	CC10	4

Objective:

To enable the students gain basic knowledge of Marketing.

UNIT – I

Marketing – Meaning, Definition, Nature and Scope – Evolution of Marketing – Approaches to the study of Marketing – Role of Marketing in Economic Development.

UNIT – II

Marketing Mix – Meaning – Definition – Elements – Marketing Process – Functions of Marketing.

UNIT – III

Transportation – Storage and Warehousing – Warehouses in India – Causes of Slow growth .

UNIT – IV

Standardisation and Grading – Labelling – Grading Vs. Standardisation – Agricultural produce – Extractive Industries and Manufactured Product – ISI and Agmark.

UNIT – V

Marketing Finance – Working Capital – Institutions in Marketing Finance – Role of STC, MMTC and EXIM Bank – Marketing Risks – Causes – Handling – Prevention, Reduction and Shifting.

Books for study:

1. Marketing by Rajan Nair, Sultan Chand & Sons.2010
2. Modern Marketing by R.S.N. Pillai, S. Chand Ltd., New Delhi.2014
3. Marketing Management in Indian Perspective by Jha and Singh, Himalaya.2013

Books for reference

1. Fundamentals of Marketing by William J. Stanton, MC Graw – Hill.2011
2. Principles of Marketing by Philip Kotler, Prentice Hall. 2010

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA4003	COMPANY LAW	4	CC11	4

Objective:

To enable the students gain basic knowledge in company law.

UNIT-I

History of Company Law in India- Companies Act, 2013- Authorities under Companies Act, 2013- Meaning and Definition of a joint stock company – Features – Kinds of companies – Differences between private and public companies.

UNIT-II

Formation of a company – Promotion – Memorandum of Association and its contents – Articles of Association and its contents – Certificate of incorporation and commencement of business.

UNIT-III

Prospectus – contents – statement in lieu of prospectus – consequences of Misstatements in Prospectus – Kinds of Shares and Debentures.

UNIT-IV

Company management – Appointment, rights, liabilities and duties of Managerial Personnel – Meetings – Kinds of meetings - Resolutions.

UNIT-V

Winding up of a company – Types of winding up – Consequences of winding up.

Books for study:

1. Dr.Srinivasan. – Company Law 2013 – Margham Publications, Chennai, 2014
2. N.D.Kapoor .Company Law 2013. Sultan Chand & Sons, New Delhi, 2013

Reference Books:

1. S.S.Raghu – Company Law – Kalyani Publishers.2015

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CA4004	STATISTICS II	4	CC12	4

Objective:

To make students acquire basic knowledge of correlation analysis, regression analysis, time series analysis, index numbers and statistical quality control.

UNIT-I: CORRELATION ANALYSIS

Meaning, Types, Merits and Limitations of correlation – Methods of studying correlation – Scatter Diagram – Karl Pearson's Coefficient of Correlation – Spearman's Rank correlation.

UNIT-II: REGRESSION ANALYSIS

Meaning, Importance, Limitations – Differences between Correlation and Regression – Regression Equations – Deviation taken from Arithmetic mean and assumed mean.

UNIT-III: TIME SERIES ANALYSIS

Meaning, uses and components of Time series – Methods of measuring Trend, Seasonal Variations and Cyclical fluctuations – Free hand method, Semi-average method, Moving average method and Method of Least squares – Seasonal Indices by Simple Average Method.

UNIT-IV: INDEX NUMBERS

Meaning, uses and problems in the construction of Index Numbers, Unweighted and Weighted Index Numbers-Laspey's, Paache's, Bowley's Fishers and Edgeworth methods - Time Reversal and Factor Reversal Tests.

UNIT-V: INTERPOLATION AND EXTRAPOLATION:

Meaning, Advantages and Limitations – Differences between Interpolation and extrapolation – binomial expansion method, Newtons advancing differences method, Lang range method.

Books for study:

1. Fundamentals of Statistics – B. N. Gupta, S.Chand& Co. Ltd, New Delhi 2012
2. Business Statistics – P.R. Vittal, Margham Publications, Chennai, 2014

Books for reference

1. Elements of Statistical Methods – S.P. Gupta, S.Chand& Co. Ltd, New Delhi 2014

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CAAL41	ALLIED-VISUAL BASIC PROGRAMMING	4	EC11	5

Objective:

To make students acquire basic knowledge of using visual basic with reference to developing business applications.

UNIT – I

Introduction to Visual Basic: Integrated Development Environment (IDE) features – Working with form properties – setting form's properties - introducing form events and form methods.

UNIT – II

Variables in Visual Basic: Data types -Declaring Variables – The Scope of a variable – Module level variables – Constants – Creating your own constants – Scope of a constant – converting data types – Arrays – Declaring arrays – Fixed size arrays – Dynamic arrays – Preserve keyword – REDIM statement.

UNIT – III

Introduction to standard controls – Command buttons – Text boxes – Labels – Option buttons – Check boxes – Frame controls – List boxes – Combo boxes – Image objects – Picture boxes – Timer – Scroll bars – File system controls (Drive, DirList, File List boxes) – Writing simple program using standard control.

UNIT – IV

Language constructs – simple if, if else, nested if, For, Next, The while loop, Select Case- End Select, Exit statement, With Structure - Built in functions- Developing simple programs using control structures- project with multiple forms.

UNIT – V

Introduction to Built-in ActiveX control – Toolbar – The Tree view control – The List view control – the Image list control – Common Dialog control – Rich textbox control – Menu editor – Database access – data control- flex grid control.

Books for study:

1. Visual Basic .Dr.Suresh Babu Margham Publications, Chennai, 2014

Books for reference

1. Mohammed Azam, Programming with Visual Basic 6.0 – Vikas Publishing House
2. Content Development Group, Visual Basic 6.0 – Tata McGraw Hill

**SEMESTER IV
(ALLIED PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CAAP41	ALLIED PRACTICAL-VISUAL BASIC PROGRAMMING-LAB	3	EC12	4

Objective:

To make students acquire practical knowledge of using visual basic with reference to developing business applications.

1. Design a form with text box to perform the alignment and format function.
2. Design a form to display the list of products by declaring array function.
3. Design an Application for Student Mark List.
4. Design a form to calculate capital budgeting technique by declaring finance function and variable declaration using option button (Radio/Check box).
5. Design a form to display an advertisement banner using image box control with string function.
6. Design a form to compute cost of capital using finance function in visual basic using check box.
7. Design a form to perform working capital analysis by declaring finance function using flex grid control.
8. Design a form to display Break-even analysis using line and chart controls, by declaring variables.
9. Design a supermarket bill to display the sales invoice, and create a database using Data Control, option button, , check box, date picker, etc.
10. Design a form to calculate minimum, maximum, reorder, reorder quantity, EOQ and display the inventory control records using data object.

**SEMESTER IV
(SKILL BASED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CASB41	CONSUMER WELFARE	2	AEC4	4

Objective:

To make students acquire basic knowledge of consumer laws, consumer rights and consumer welfare.

Unit I

Consumer: Meaning-Legal Definition of consumer, Types of Consumers-Consumer Welfare-Measures taken by Central & State Government towards consumer welfare. E Commerce & Consumer welfare.

Unit II

Consumer Protection Act 1986 – Objectives of Consumer Protection Act - Consumer Protection Act 2002 (Amendment), Composition of powers of National Commission, State Commission and District Consumer Forum.

Unit III

Redressal of consumer grievances-Goods & Services covered under Consumer Protection Act-Procedure for filing of complaints with District Forum, State Commission , National Commission.

Unit IV

Enforcement of orders by various Forums. Appeal against orders passed by –District Forum-State Commission-National Commission

Unit V

Consumer welfare in Developed Countries- Consumer Welfare in India-Recent trends-Supreme Court and High court rulings in favour of Consumer welfare- Important Case Laws

Books for study:

1. Consumer Behaviour by Rajan Nair, Sultan Chand & Sons.2010
2. Consumer Protection (Amendment)Act,2002. S.Chand & Sons.2012

Books for reference

3. Principles of Marketing by Philip Kotler, Prentice Hall.2010

SYLLABUS
For
B.Sc. MATHEMATICS
SEMESTERS – III & IV
(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MS3001	DIFFERENTIAL EQUATIONS & VECTOR ANALYSIS	7	CC07	7

Objectives:

Solving first order and of higher degree differential equations, second order differential equations. Formation of PDEs by different methods, solving differential equations of Lagrange's type and also by the method of Multipliers. Clairaut's Equations.

Familiar with physical interpretation of divergence and curl of a vector and exposed to evaluating line, surface and volume integrals.

UNIT I

Equations of the first order but of higher degree: Equations solvable for dy/dx - Equations solvable for y - Equations solvable for x - Clairaut's form - Equations that do not contain x explicitly - Equations that do not contain y explicitly - Equations homogeneous in x and y - Exact Differential Equations - Rules for finding Integrating factors.

UNIT II

Linear Equations with constant coefficients: Complementary function of a linear equation with constant coefficients - General methods of finding Particular Integrals - Linear Equations with variable coefficients - Equations reducible to the linear equations.

UNIT III

Partial Differential Equations of the first order: Classification of integrals, Derivation of PDE by elimination of arbitrary constants and arbitrary functions, Lagrange's method of solving the linear equation, Special methods, Standard forms I,II,III and IV(Clairaut's form).

UNIT IV

Vector differentiation - The vector differential operator - Gradient- Direction and magnitude of gradient- Divergence and curl- formula involving ∇ operator, operators involving ∇ twice.

UNIT V

Vector integration: Line integral - surface integral - volume integral - problems on these - Gauss divergence theorem, Stoke's theorem and Green's theorem(without Proof) - simple verification of theorems and problems.

Text Books.

1. S. Narayanan and T. K. Manicavachagom Pillay, *Differential Equations*, S. Viswanathan Publishers Pvt. Ltd, 1988.

UNIT I Chapter IV Sec. 1 - 4, Chapter II - Sec. 6.1 - 6.4

UNIT II Chapter V Sec. 1 – 6.

UNIT III Chapter XII 1 - 5.4

2. S. Narayanan and T.K. Manicavachagom Pillai, *Vector Algebra and Analysis*, S. Viswanathan Publishers Pvt. .Ltd., 1995.

UNIT IV Chapter 4 Sec.6 to 12

UNIT V Chapter 6 Sec.2 to 10

REFERENCE BOOKS:

1. M.D. Raisinghania, Ordinary and Partial Differential Equations, S. Chand & Co.
2. M.L. Khanna, Differential Equations, Jaiprakashnath and Co., 2004.
3. Dr. M. K. Venkataraman, Engineering Mathematics Volume III B, National Publishing Company, 13th Edition, 1998.
4. M.L. Khanna, Vector Calculus, Jai Prakash Nath and Co., Eighth Edition, 1986.

**SEMESTER III
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSPR31	PRACTICAL III – MATHEMATICAL AUTOMATION- I	1	CC08	2

List of Programs:

- Type an equation using Math type
- Bar diagram, pie chart, histogram
- Export equations
- Format equations
- Convert equations
- Equation numbering
- Page layout and typesetting for books involving equations with numbers, reference insert, chapter and section and subsections

REFERENCE BOOK:

MS WORD MANUAL

**SEMESTER III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSAL31	ALLIED-MATHEMATICAL STATISTICS – I	6	CC09	7

Objectives: To apply Statistics Methods for Mathematical Problems.

UNIT– I

Concept of Sample space – Events – Definition of Probability(Classical, Statistical and Axiomatic) – Addition and Multiplication laws of Probability – Independent of events – Conditional probability – Baye’s Theorem – Simple Problems.

Chapter 4 : Sections 4.5, 4.6, 4.7, 4.9.

UNIT–II

Random variables (Discrete and continuous) – Distribution function – Expectation and Moments – Simple Problems.

Chapter 5 : Sections 5.1, 5.2, 5.3, 5.4.

Chapter 6 : Sections 6.1 – 6.3.

UNIT–III

Moment Generating function – Probability generating function – Cumulant generating function –Characteristic function – Properties – Uniqueness and inversion theorem (Statement only) Chebychev’s inequality.

Chapter 6 : Sections 6.10, 6.11, 6.12, 6.12.1, 6.12.2, 6.13, 6.17.

UNIT–IV

Standard distributions: Discrete distributions – Binomial, Poisson – Continuous distributions– Normal, Uniform, Exponential, Gamma and Beta distributions, Interrelation among these Distributions.

Chapter 7 : Sections 7.2, 7.3, 7.3.5, 7.8.

Chapter 8 : Sections 8.2, 8.2.3, 8.2.7, 8.3, 8.4, 8.6.

UNIT–V

Concept of Bivariate distribution – Correlation – Karl Pearson’s coefficient of correlation – Rank correlation – Linear Regression – Concept of Partial and Multiple correlation (Three variables only).

Chapter 10 : Sections 10.1, 10.3, 10.4, 10.6, 10.6.1, 10.7, 10.7.1 – 10.7.4.

CONTENT AND TREATMENT AS IN:

FUNDAMENTALS OF MATHEMATICAL STATISTICS, *S. C. Gupta and V. K. Kapoor*, 8th Edition, (1982), Sultan Chand & Sons, New Delhi.

REFERENCES:

1. INTRODUCTION TO MATHEMATICAL STATISTICS, *R. V. Hogg and A. T. Craig*, (1998), Macmillan.
2. INTRODUCTION TO THEORY OF STATISTICS, *A.M. Mood, G.A. Graybil and D.G. Boes*, (1974), McGraw Hill.
3. ELEMENTARY STATISTICAL ANALYSIS, *S.S. Wilks*, Oxford and IBH.

SEMESTER III
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSAP31	Allied Practical -Mathematical Statistics I	2	AEC3	2

1. Measures and Dispersion (absolute and relative)
2. Computation of Correlation Coefficient for raw and Grouped data, Rank Correlation Coefficient and Coefficient of Concurrent deviation.
3. Computation of Regression Equation for Raw and Grouped Data.
4. Curve Fitting by the Method of Least Squares
 - a) $y = ax + b$.
 - b) $y = ax^2 + bx + c$.
 - c) $y = ae^{bx}$.
 - d) $y = ax^b$.
5. Fitting of Binomial, Poisson, Normal distribution and test of goodness of fit.

NOTE:

Use of Scientific Calculator shall be permitted for practical examination. Statistical and Mathematical tables are to be provided to the students at the examination hall.

CONTENT AND TREATMENT AS IN:

STATISTICAL METHODS, *S. P. Gupta*, Sultan Chand & Sons, New Delhi.

REFERENCES:

1. INTRODUCTION TO MATHEMATICAL STATISTICS, *R.V. Hogg and A.T. Craig*, (1998), Macmillan.
2. INTRODUCTION TO THEORY OF STATISTICS, *A. M. Mood, G. A. Graybill and D.G. Boes*, (1974), McGraw Hill.
3. ELEMENTARY STATISTICAL ANALYSIS, *S. S. Wilks*, Oxford and IBH.
4. FUNDAMENTAL OF APPLIED STATISTICS, *S.C. Gupta and V.K. Kapoor*, Sultan & sons.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MS4001	SPECIAL TRANSFORMS	7	CC10	7

Objectives: To introduce the concepts of Laplace transforms and use them to solve differential equations and introduce the concepts of Fourier transforms and Z-transforms.

UNIT-I : LAPLACE TRANSFORMS

Introduction – Definition – Conditions for existence – Transforms of elementary functions – Properties of Laplace transforms - Transforms of Periodic functions – Transforms of Derivatives – Transforms of integrals – Multiplication by t^n – Division by t – Simple problems.

UNIT-II : INVERSE LAPLACE TRANSFORMS

Inverse Laplace Transforms – – Shifting property - Convolution theorem - Methods of Partial Fractions –Heavi-Side Expansion Formula – Simple problems.

UNIT-III : APPLICATION OF LAPLACE TRANSFORM TO DIFFERENTIAL EQUATIONS

Solving Linear Differential equations with constant coefficients – Solving Simultaneous Linear Differential equations with constant coefficients using Laplace Transforms.

UNIT-IV : FOURIER TRANSFORMS

Introduction–Definition– Fourier transforms–Fourier Sine and Cosine transforms–Properties of Fourier transforms.- Parseval's identity for Fourier transforms – Relation between Fourier and Laplace Transforms.

UNIT-IV : Z – TRANSFORMS AND ITS APPLICATIONS

Definition – Some standard Z transforms – Linearity property –Damping rule – Some standard results- Shifting U_n to right & to left – Multiplication by n – Two basic theorems - Inverse Z-transforms – Evaluation of Z transforms – Solving difference equations using Z-transforms

CONTENT AND TREATMENT AS IN:

1. LAPLACE AND FOURIER TRANSFORMS, *Goyal Gupta*,Pragati Edition.
UNIT I Chapter 1: Page 1- 43.
UNIT II Chapter 1 : 62 – 83.
UNIT III Chapter 1 : 122 – 150.

UNIT IV Chapter 2 : 187 – 223.

2. HIGHER ENGINEERING MATHEMATICS, *Dr.B.S.Grewal*, 40th Edition.

UNIT V Chapter 23 : 866 – 885.

REFERENCES:

TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS, *G.Balaji*, Balaji Publications.

**SEMESTER IV
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSPR41	PRACTICAL IV- MATHEMATICAL AUTOMATION II	1	CC11	2

List of Programs in MS excel:

- To find the bar diagram, pie chart, Histogram.
- To find the mean median mode standard deviation
- To find the covariance and correlation coefficient.
- To plot both XY scatter diagram and regression lines.
- To compute Probability Mass function and Cumulative distribution function of Chi-square distribution, binomial distribution, poisson distribution, exponential distribution.
- Sorting techniques
- Logical techniques
- Salary calculation with basic pay, allowance, deduction and TDS also.

REFERENCE BOOK:

MS OFFICE MANUAL

**SEMESTER IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSAL41	ALLIED-MATHEMATICAL STATISTICS II	6	CC12	7

Objectives: To apply Statistics for Mathematical Problems

UNIT– I

Statistical Population Census and sampling survey – Parameter and statistics – Sampling and sampling distribution and standard Error. Sampling distributions – Students t , Chi - square and F - distributions.

Chapter 12 : Sections 12.2, 12.3, 12.3.1, 12.3.2, 12.12.

UNIT –II

Test of significance – Large sample test for proportion, mean and standard deviation – Exact test based on Students t , Chi - square and F distribution with respect to population mean, variance and correlation coefficient – Test of independence of attributes – Goodness of fit tests.

Chapter 12 : Sections 12.13 – 12.15; Chapter 13 : Sections 13.7.2, 13.7.3.

Chapter 14 : Sections 14.12.9.

UNIT –III

Point Estimation – Concept of unbiasedness, consistency, efficiency and sufficiency – Cramer – Rao inequality – methods of Estimation – maximum likelihood Estimation – Method of moments – Interval Estimation.

Chapter 15 : Sections 15.2, 15.2.1 -15.2.3, 15.2.5, 15.2.6, 15.3, 15.3.1, 15.3.3, 15.4.

UNIT –IV

Test of Hypothesis: Null and alternate Hypothesis – Type I and Type II errors – Power of the test – Neymann Pearson lemma – Likelihood Ratio Test – Concept of Most Powerful test.

Chapter 16 : Sections 16.2.2, 16.2.3, 16.2.5, 16.2.7, 16.4.7, 16.5, 16.6.

UNIT –V

Analysis of Variance – One way and Two way classification – Basic principle of Design of Experiments – Randomized Block Design and Latin Square design.

Chapter 5 and Chapter 6 (in STATISTICAL METHODS, *S. P. Gupta*).

CONTENT AND TREATMENT AS IN:

1. FUNDAMENTALS OF MATHEMATICAL STATISTICS, *S. C. Gupta and V. K. Kapoor, 8th Edition, (1982), Sultan Chand & Sons, New Delhi.*
2. STATISTICAL METHODS, *S. P. Gupta, Sultan Chand & Sons, New Delhi.*

REFERENCES:

1. INTRODUCTION TO MATHEMATICAL STATISTICS, *R. V. Hogg and A. T. Craig, (1998), Macmillan.*
2. INTRODUCTION TO THEORY OF STATISTICS, *A. M. Mood, G. A. Graybil and D. G. Boes, (1974), McGraw Hill.*
3. ELEMENTARY STATISTICAL ANALYSIS, *S. S. Wilks, Oxford and IBH.*
4. FUNDAMENTAL OF APPLIED STATISTICS, *S.C. Gupta and V.K. Kapoor, Sultan & sons.*

SEMESTER IV
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5MSAP41	ALLIED PRACTICAL – MATHEMATICAL STATISTICS II	1	AEC4	2

1. Large sample tests with regard to population mean, proportion, standard deviation
2. Exact test with Respect to mean, Variance and coefficient of correlation
3. Test for independence of Attributes Based on Chi – Square Distribution
4. Confidence interval based on Normal Students and Chi square and F distribution
5. Problems based on ANOVA one way and two way classification
6. Completely Randomized Design
7. Latin Square Design.

NOTE:

Use of Scientific Calculator shall be permitted for practical examination. Statistical and Mathematical tables are to be provided to the students at the examination hall

REFERENCE:

1. INTRODUCTION TO MATHEMATICAL STATISTICS, *R. V. Hogg and A. T. Craig*, (1998), Macmillan.
2. INTRODUCTION TO THEORY OF STATISTICS, *A. M. Mood, G. A. Graybil and D. G. Boes*, (1974), McGraw Hill.
3. ELEMENTARY STATISTICAL ANALYSIS, *S. S. Wilks*, Oxford and IBH.
4. FUNDAMENTAL OF APPLIED STATISTICS, *S.C. Gupta and V.K. Kapoor*, Sultan & sons.

SYLLABUS
For
M.Sc. MATHEMATICS
SEMESTERS – III & IV
(UNDER CBCS)

2016-2017

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS1001	ALGEBRA –I	5	6

Objectives: To introduce the concept and to develop working knowledge on classequation, solvability of groups, finite abelian groups, linear transformations, realquadratic forms.

UNIT–I

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). (18 hours)

UNIT–II

Solvable groups – Direct products – Finite abelian groups – Modules.

Chapter 5 : Section 5.7 (Lemma 5.7.1, Lemma 5.7.2 theorem 5.7.1)

Chapter 2 : Sections 2.13 and 2.14 (Theorem 2.14.1 only)

Chapter 4 : Section 4.5 (18 hours)

UNIT–III

Linear Transformations: Canonical forms – Triangular form – Nilpotenttransformations.

Chapter 6: Sections 6.4 and 6.5. (18 hours)

UNIT–IV

Jordan form –Rational canonical form.

Chapter 6: Sections 6.6 and 6.7. (18 hours)

UNIT– V

Trace and transpose –Hermitian, Unitary, Normal transformation, real Quadraticform.

Chapter 6: Sections 6.8, 6.10 and 6.11 (Omit 6.9). (18 hours)

CONTENT AND TREATMENT AS IN:

TOPICS IN ALGEBRA (Second Edition), I.N.Herstein, (1975) Wiley EasternLimited, New Delhi.

REFERENCES:

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

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS1002	REAL ANALYSIS I	5	6

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

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.

INFINITE SERIES: 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 (18 hours)

UNIT–II : THE RIEMANN–STIELTJES INTEGRAL

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: Section 7.1 to 7.14 (18 hours)

UNIT–III : THE RIEMANN–STIELTJES INTEGRAL

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 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
hours)

(18

UNIT-IV : INFINITE SERIES AND INFINITE PRODUCTS

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 :Section 8.20, 8.21 to 8.26

Chapter 9 :Section 9.14, 9.15, 9.19 9.20, 9.22, 9.23
hours)

(18

UNIT-V : SEQUENCE OF FUNCTIONS

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 Riemann–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 Sec 9.1 to 9.6, 9.8, 9.9, 9.10, 9.11, 9.13
hours)

(18

CONTENT AND TREATMENT AS IN:

PRINCIPLES OF MATHEMATICAL ANALYSIS, (Second Edition), *Tom M. Apostol*, (1974), Addison–Wesley Publishing Company Inc. New York.

REFERENCES:

1. REAL ANALYSIS, *R. G. Bartle*, (1976), John Wiley and sons Inc.
2. PRINCIPLES OF MATHEMATICAL ANALYSIS, (3rd Edition), *W. Rudin*, (1976), McGraw Hill Company, New York.
3. MATHEMATICAL ANALYSIS, *S. C. Malik and Savita Arora*, (1991), Wiley Eastern Limited. New Delhi.
4. INTRODUCTION TO REAL ANALYSIS, *Sanjay Arora and Bansilal*, (1991), Satya Prakashan, New Delhi.
5. PRINCIPLES OF REAL ANALYSIS, *A.L. Gupta and N. R. Gupta*, (2003), Pearson Education.

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS1003	ORDINARY DIFFERENTIAL EQUATIONS	4	6

Objectives: To develop strong background on finding solutions to linear differentialequations with constant and variable coefficients and also with singular points, tostudy existence and uniqueness of the solutions of first order differential equations.

UNIT-I : LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS

Second orderhomogeneous equations – Initial value problems – Linear dependence andindependence –Wronskian and a formula for Wronskian– Non-homogeneousequation of order two.

Chapter 2 : Sections 1 to 6. (18 hours)

UNIT-II : LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS

Homogeneous andnon-homogeneous equation of order n – Initial value problems – Annihilator methodto solve non-homogeneous equation – Algebra of constant coefficient operators.

Chapter 2 : Sections 7 to 12. (18 hours)

UNIT-III : LINEAR EQUATION WITH VARIABLE COEFFICIENTS

Initial value Problems– Existence and uniqueness theorems – Solutions to solve a non-homogeneousequation –Wronskian and linear dependence – Reduction of the order of a homogeneousequation – Homogeneous equation with analytic coefficients – The Legendre equation.

Chapter 3: Sections 1 to 8 (Omit Section 9) (18 hours)

UNIT-IV : LINEAR EQUATION WITH REGULAR SINGULAR POINTS

Euler equation– Second order equations with regular singular points – Exceptional cases – Besselfunction.

Chapter –4 : Sections 1 to 4 and 6 to 8 (Omit sections 5 and 9) (18 hours)

UNIT-V : EXISTENCE AND UNIQUENESS OF SOLUTIONS TO FIRST ORDER EQUATIONS

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 (Omit sections 7 to 9) (18 hours)

CONTENT AND TREATMENT AS IN:

AN INTRODUCTION TO ORDINARY DIFFERENTIAL EQUATIONS, *E.A.Coddington*, (2007), Prentice – Hall of India Ltd., New Delhi.

REFERENCES:

1. ORDINARY DIFFERENTIAL EQUATIONS, *W.T. Reid*, (1971), John Wiley and Sons, New York.
2. ADVANCED DIFFERENTIAL EQUATIONS, *M.D. Raisinghania*, (2001), S.Chand & Company Ltd. New Delhi.

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS1004	MECHANICS	4	6

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

The mechanical systems – Generalized co-ordinates – Constraints – Virtual work – Energy and Momentum.

Chapter 1 : Section 1.1 to 1.5 (18 hours)

UNIT-II : LANGRANGE'S EQUATIONS

Derivation of Lagrange's equations – Examples – Integrals of motion.

Chapter 2 : Sections 2.1 to 2.3 (18 hours)

UNIT-III : HAMILTON'S EQUATIONS

Hamilton's Principle – Hamilton's equations – Other Variational Principle.

Chapter 4 : Sections 4.1 to 4.3 (18 hours)

UNIT-IV : HAMILTON'S – JACOBI THEORY

Hamilton's Principle Function – Hamilton-Jacobi Equation – Separability.

Chapter 5 : Section 5.1 to 5.3 (18 hours)

UNIT-V : CANONICAL TRANSFORMATION

Differential forms and Generating functions – Special Transformations – Lagrange and Poisson brackets.

Chapter 6 : Section 6.1, 6.2 and 6.3 (18 hours)

CONTENT AND TREATMENT AS IN:

CLASSICAL DYNAMICS, *D. T. Greenwood*, (1985), Prentice Hall of India, New Delhi.

REFERENCES:

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

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MSE101	RESOURCE MANAGEMENT TECHNIQUES	4	6

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

UNIT-I : INTEGER LINEAR PROGRAMMING

Types of Integer Linear Programming Problems – Concept of Cutting Plane – Gomory's All Integer Cutting Plane Method–Gomory's mixed Integer Cutting Plane Method – Branch and Bound Method –One Integer Programming.

Chapter 8. (18 hours)

UNIT-II : CLASSICAL OPTIMIZATION METHODS

Unconstrained Optimization – Constrained Multivariable Optimization with Equality Constraints – Constrained Multivariable Optimization with Inequality Constraints.

NON-LINEAR PROGRAMMING METHODS: Examples of NLPP – General NLPP – Graphical solution.

Chapter 23. (18 hours)

UNIT-III : THEORY OF SIMPLEX METHOD

Canonical and Standard form of LP – Slack and Surplus Variables – Reduction of any Feasible solution to a Basic Feasible solution – Alternative optimal solution – Unbounded solution – Optimality conditions– Some complications and their resolutions – Degeneracy and its solutions (Theorems with proof).

Chapter 25. (18 hours)

UNIT-IV : REVISED SIMPLEX METHOD

Standard forms for Revised simplex method –Computational procedure for Standard form I – Comparison of Simplex method and Revised simplex Method.

BOUNDED VARIABLES LP PROBLEM : The Simplex Algorithm.

Chapter : 26 and 28.
hours)

(18

UNIT–V : PARAMETRIC LINEAR PROGRAMMING

Variation in the coefficients c_j , –Variations in the Right hand side b_i .

GOAL PROGRAMMING: Difference between LP and GP. approach – Concept of Goal Programming –Goal Programming Model Formulation–Graphical Solution Method of Goal programming – Modified Simplex method of goal Programming.

Chapter: 29 and 30.
hours)

(18

CONTENT AND TREATMENT AS IN:

OPERATIONS RESEARCH, *J.K.Sharma*, (2007), Macmillian(India), New Delhi.

REFERENCES:

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

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MSE102	GRAPH THEORY	4	6

Objectives: To study and develop the concepts of Graphs, sub graphs, Trees, connectivity, Euler's theorem, Hamilton Cycles, Matching, coloring of graphs, Independent sets, cliques, vertex coloring and planar graphs.

UNIT-I : GRAPHS, SUB GRAPHS AND TREES

Graph and simple graphs –Graph isomorphism – The Incidence and adjacency matrices –Sub graph – Vertex degrees – Paths and connection –Cycles –Trees –Cut edges and bonds –Cut vertices.

Chapter 1 : Section 1.1 to 1.7, Chapter 2 : Section 2.1 to 2.3 (18 hours)

UNIT-II : CONNECTIVITY:

Euler's tours and Hamilton Cycles Connectivity – Blocks – Eulertours – Hamilton cycles.

Chapter 3 : Section 3.1 to 3.2, Chapter 4 : Section 4.1 to 4.2 (18 hours)

UNIT-III : MATCHINGS, EDGE COLORINGS

Matching – Matching and coverings in Bipartite graphs – Edge chromatic number – Vizing's theorem.

Chapter 5 : Section 5.1 – 5.2, Chapter 6 : Section 6.1 – 6.2 (18 hours)

UNIT-IV : INDEPENDENT SETS AND CLIQUES, VERTEX COLORINGS

Independent sets– Ramsey's theorem –Chromatic number – Brooks' theorem – Chromatic polynomials.

Chapter 7 : Section 7.1 – 7.2, Chapter 8 : Section 8.1, 8.2, 8.4 (18 hours)

UNIT-V : PLANAR GRAPHS

Plane and planar graphs –Dual graphs – Euler's formula –The five color theorem and four color conjecture.

CONTENT AND TREATMENT AS IN:

GRAPH THEORY AND APPLICATIONS, *J.A.Bonday and U. S. R. Murthy*, (1976),McMillan, London.

REFERENCES:

1. A FIRST LOOK AT GRAPH THEORY, *J.Clark and D.A. Holton*, (1995),Allied publishers, New Delhi.
2. GRAPH THEORY, *R. Gould Benjamin Cummings*, (1989), Menlo Park.
3. ALGORITHMIC GRAPH THEORY, *A.Gibbons*, (1989), Cambridge University Press,Cambridge.
4. GRAPHS : AN INTRODUCTORY APPROACH, *R.J. Wilson and J.J.Watkins*, (1989), John Wiley and Sons, New York.
5. INTRODUCTION TO GRAPH THEORY, (Fourth Edition), *R.J. Wilson*,(2004), Pearson Education.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS2001	ALGEBRA II	5	5

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 – Transcendence of e .

Chapter 5 : Section 5.1 and 5.2. (15 hours)

UNIT-II

Roots of polynomials – More about roots.

Chapter 5 : Section 5.3 and 5.5 (15 hours)

UNIT-III

Elements of Galois theory.

Chapter 5 : Section 5.6. (15 hours)

UNIT-IV

Finite fields –Wedderburn's theorem on finite division rings.

Chapter 7 : Sections 7.1 and 7.2 [Only theorem 7.2.1.] (15 hours)

UNIT-V

Solvability by radicals – A theorem of Frobenius– Integral Quaternions and the Four-Square theorem.

Chapter 5: Section 5.7 [Omit Lemmas 5.7.1, 5.7.2 and Theorem 5.7.1]

Chapter 7: Section 7.3 and 7.4. (15 hours)

CONTENT AND TREATMENT AS IN:

TOPICS IN ALGEBRA, (Second Edition), I.N.Herstein, (1975), Wiley Eastern Limited, New Delhi.

REFERENCES:

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

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS2002	REAL ANALYSIS II	5	6

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

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 in trigonometric series – The Riemann-Lebesgue Lemma – The Dirichlet Integrals – An integral representation for the partial sums of Fourier series – Riemann's localization theorem– Sufficient conditions for convergence of a Fourier Series at a particular point – Cesàro summability of Fourier series – Consequences of Fejér's theorem – The Weierstrass approximation theorem.

Chapter 11: Section 11.1 to 11.15 (Tom M. Apostol) (18 hours)

UNIT-II : MULTIVARIABLE DIFFERENTIAL CALCULUS

Introduction – The Directional derivative – Directional derivative and continuity – The total derivative – The total derivative expressed in terms of partial derivatives – 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 \mathbb{R}^n to \mathbb{R}^1 .

Chapter 12 : Section 12.1 to 12.14 (Tom M. Apostol) (18 hours)

UNIT-III : IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS

Functions with non-zero Jacobian determinants – The inverse function theorem – The Implicit function Theorem – Extrema of real valued functions of several variables – Extremum problems with side conditions.

Chapter 13 : Section 13.1 to 13.7 (Tom M. Apostol) (18 hours)

UNIT–IV : THE LEBESGUE INTEGRAL

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 : Section 11.1 to 11.5 (R.R. Goldberg) (18 hours)

UNIT–V : THE LEBESGUE INTEGRAL

Properties of the Lebesgue integral for bounded measurable functions – The Lebesgue integral for unbounded functions – Some fundamental theorems – The metric space $L^2[a, b]$ – The integral on $(-\infty, \infty)$ and the plane.

Chapter 11 : Section 11.6 to 11.10 (R.R. Goldberg) (18 hours)

CONTENT AND TREATMENT AS IN:

1. MATHEMATICAL ANALYSIS, Tom M. Apostol, (1974), Second Edition, Addison – Wesley Publishing Company Inc. New York, (for units I, II & III).
2. METHODS OF REAL ANALYSIS, Richard R. Goldberg, (1975), Oxford & IBH Publishing, New Delhi (for Unit IV & V).

REFERENCES:

1. THE LEBESGUE INTEGRAL, J. C. Burkill, (1951), Cambridge University Press.
2. MEASURE AND INTEGRATION, M. E. Munroe, (1971), Addison–Wiley.
3. REAL ANALYSIS, H. L. Royden, (1988), Macmillan Pub. Company, New York.
4. PRINCIPLES OF MATHEMATICAL ANALYSIS, W. Rudin, (1979), McGraw Hill Company, New York.
5. MATHEMATICAL ANALYSIS, S. C. Malik and Savita Arora, (1991), Wiley Eastern Limited, New Delhi.
6. INTRODUCTION TO REAL ANALYSIS, Sanjay Arora and Bansilal, Satya Prakashan, (1991), New Delhi.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS2003	PARTIAL DIFFERENTIAL EQUATIONS	4	6

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

Formation and solution of PDE – Integral surfaces – Cauchy problem order equation – Orthogonal surfaces – First order non-linear – Characteristics – Compatible system – Charpit method.

Chapter 0 : 0.4 to 0.11 (Omit 0.1, 0.2, 0.3 and 0.11.1)
(18 hours)

UNIT-II : FUNDAMENTALS

Introduction – Classification of Second Order PDE – Canonical Forms – Adjoint Operators – Riemann's method.

Chapter 1 : 1.1 to 1.5 (18 hours)

UNIT-III : ELLIPTIC DIFFERENTIAL EQUATIONS

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: 2.1, 2.2, 2.5 to 2.7, 2.10 to 2.13 (Omit 2.3, 2.4, 2.8 and 2.9) (18 hours)

UNIT-IV : PARABOLIC DIFFERENTIAL EQUATIONS

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: 3.1 to 3.7 and 3.9 (omit 3.8) (18 hours)

UNIT-V : HYPERBOLIC DIFFERENTIAL EQUATIONS

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 :Section 4.1 to 4.12 [omit 4.5, 4.6 and 4.10] (18 hours)

CONTENT AND TREATMENT AS IN:

INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS, *K. Sankara Rao*, (2007), Second Edition, Prentice Hall of India, New Delhi.

REFERENCES:

1. PARTIAL DIFFERENTIAL EQUATIONS, (Second Edition), *R.C. Mc Owen*, (2005), Pearson Education, New Delhi.
2. ELEMENTS OF PARTIAL DIFFERENTIAL EQUATIONS, *I.N. Snedden*, (1983), McGraw Hill, New Delhi.
3. ADVANCED DIFFERENTIAL EQUATIONS, *M.D. Raisinghania*, (2001), S. Chand & Company LTD, New Delhi.

**SEMESTER II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MS2004	ADVANCED NUMERICAL ANALYSIS	4	5

Objectives: To introduce the derivation of numerical methods with error analysis and give better understanding of the subject.

UNIT-I

Transcendental and Polynomial equations Iteration methods based on second degree equation – Rate of convergence – Iteration methods – Methods for complex roots – Polynomial equations.

Chapter 2 : 2.4 to 2.8 (15 hours)

UNIT-II

System of linear algebraic equations and Eigen value problems Direct methods – Triangularisation, Cholesky and Partition methods – Error analysis – Iteration methods – Eigenvalues and Eigenvectors – Jacobi's method, Gauss-Jordan method, Gauss-Seidel method and Power method.

Chapter 3 : 3.2 to 3.5 (15 hours)

UNIT-III

Interpolation and Approximation Hermite Interpolations – Piecewise and Spline Interpolation – Bivariate interpolation – Approximation – Least Square approximation – Uniform approximation.

Chapter 4 : 4.5 to 4.10 (15 hours)

UNIT-IV

Differentiation and Integration Numerical Differentiation – Partial Differentiation – Numerical Integration methods based on undetermined coefficients – Double integration.

Chapter 5 : 5.2, 5.5, 5.6, 5.8, 5.11 (15 hours)

UNIT-V

Ordinary differential equations Numerical methods – Single step methods – Multistep methods – Predictor-Corrector methods.

Chapter 6 : 6.2 to 6.5 (15 hours)

CONTENT AND TREATMENT AS IN:

Numerical Methods for Scientific and Engineering Computation, *M.K. Jain, S.R.K. Iyengar and R.K. Jain*, (1993), 3rd Edition, New Age International.

REFERENCES:

1. ELEMENTARY NUMERICAL ANALYSIS – An Algorithmic approach, *S. D. Conte and de Boor*, 3rd Edition, McGraw Hill International Book Company, 1980.
2. NUMERICAL MATHEMATICAL ANALYSIS, *James B. Scarborough*, Oxford & IBH Publishing Company, New Delhi.
3. INTRODUCTION TO NUMERICAL ANALYSIS, *F.B. Hildebrand*, McGrawHill, New York, 1956.

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MSE201	OPERATIONS RESEARCH	4	6

Objectives: This course aims to introduce decision theory, PERT, CPM, deterministic and probabilistic inventory systems, queues, replacement and maintenance problems.

UNIT-I : DECISION THEORY

Steps in Decision theory Approach – Types of Decision Making Environments – Decision Making Under Uncertainty – Decision Making under Risk – Posterior Probabilities and Bayesian Analysis – Decision Tree Analysis – Decision Making with Utilities.

Chapter 11: Section 11.1 to 11.8 (18 hours)

UNIT-II : PROJECT MANAGEMENT: PERT AND CPM

Basic Differences between PERT and CPM – Steps in PERT/ CPM Techniques – PERT / CPM Network Components and Precedence Relationships – Critical path Analysis – Probability in PERT Analysis – Project time – Cost Trade off – Updating the Project – Resource Allocation.

Chapter 13: Sections 13.1 to 13.7 (18 hours)

UNIT-III : DETERMINISTIC INVENTORY CONTROL MODELS

Meaning of Inventory control – Functional Classification – Advantage of Carrying Inventory – Features of Inventory System – Inventory Model building – Deterministic Inventory Models with no shortage – Deterministic Inventory with Shortages.

Chapter 14: Sections 14.1 to 14.8. (18 hours)

UNIT-IV : QUEUEING THEORY

Essential Features of Queuing System – Operating Characteristic of Queuing System – Probabilistic Distribution in Queuing Systems Classification of Queuing Models – Solution of Queuing Models – Probability Distribution of Arrivals and Departures – Erlangian Service time Distribution with k-phases.

Chapter 16 : Section 16.1 to 16.7,16.9. (18 hours)

UNIT–V : REPLACEMENT AND MAINTENANCE MODELS

Failure Mechanism of items– Replacement of Items Deteriorates with Time – Replacement of items that fail completely – other Replacement Problems

Chapter 17 : Section 17.1 to 17.5 (18 hours)

CONTENT AND TREATMENT AS IN:

OPERATIONS RESEARCH, *J.K. Sharma*, (2007), Mac Millan India, New Delhi.

REFERENCES:

1. INTRODUCTION TO OPERATIONS RESEARCH, (Eighth edition), *F.S.Hillier and J.Lieberman*, (2006), Tata McGraw Hill Publishing Company, New Delhi.
2. FOUNDATIONS OF OPTIMIZATION, (Second edition), *Beightler. C, D.Phillips, B. Wilde*, (1979), Prentice Hall New York.
3. LINEAR PROGRAMMING AND NETWORK FLOW, *Bazaraa, M.S;J.J.Jarvis, and H.D.Sharall*, (1990), John Wiley and sons, New York.
4. FUNDAMENTALS OF QUEUING THEORY, *Gross, D and C.M. Harris*, [3rd Edition], (1998), Wiley and Sons, New York.
5. OPERATIONS RESEARCH, (Sixth edition), *HamdyA.Taha*, Prentice–Halle of India Private Limited, New Delhi.

SEMESTER II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6MSE202	ALGEBRAIC NUMBER THEORY	4	6

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

Rings and Fields – Factorization of Polynomials – Field Extensions – Symmetric Polynomials – Modules – Free Abelian Groups.

Chapter 1 : Sections 1.1 to 1.6. (18 hours)

UNIT-II : ALGEBRAIC NUMBERS

Conjugates and Discriminants – Algebraic Integers – Integral Bases – Norms and Trace – Rings of Integers.

Chapter 2 : Sections 2.1 to 2.6. (18 hours)

UNIT-III : QUADRATIC AND CYCLOTOMIC FIELDS

Quadratic fields and cyclotomic fields : Factorization into irreducibles : Trivial factorization – 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. (18 hours)

UNIT-IV

Prime Factorization – Euclidean Domains – Euclidean Quadratic fields – Consequences of unique factorization – The Ramanujan–Nagell Theorem.

Chapter 4 : Section 4.5 to 4.9. (18 hours)

UNIT-V : IDEALS

Prime Factorization of ideals – The norms of an ideal – Non unique Factorization in Cyclotomic Fields.

Chapter 5 : Section 5.2 to 5.4. (18 hours)

CONTENT AND TREATMENT AS IN:

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

REFERENCES:

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

**SYLLABUS
For
B.Sc. PHYSICS**

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PY3001	CLASSICAL MECHANICS AND RELATIVITY	5	CC07	5

Objective: This paper aims to impart the fundamental understanding of mechanics and their applications of different systems and also to impart the knowledge on theory of relativity and its applications.

UNIT -I

Introduction: Conservation Principles (Laws)- Mechanics of a Particle- Mechanics of a system of Particles- Conservation of Linear Momentum- Conservation of Angular Momentum- Newton's Laws and their Limitations- Compound pendulum – theory – equivalent simple pendulum – determination of g and k – Rigid body – moment of inertia.

UNIT- II*

Centre of gravity of solid and hollow tetrahedron, solid and hollow hemisphere – Centre of pressure – vertical rectangular lamina – vertical triangular lamina – Meta centric height and its determination.

Hydrodynamics - Equation of continuity of flow – Venturimeter – Euler's equation of unidirectional flow – Torricelli's theorem – Bernoulli's theorem and its applications.

UNIT- III

Mechanics for a system of particles Constraints – Holonomic and non-holonomic constraints – Generalized co-ordinates – transformation equations – configuration space – Principles of virtual work – D'Alembert's principle – Lagrange's equation - Applications of Lagrange's equation Simple pendulum – Compound pendulum – Bead sliding on a uniformly rotating wire - Atwood machine.

UNIT- IV

Hamiltonian formulation of classical mechanics – phase space – Hamiltonian function – Hamilton's canonical equations of motion- Physical significance of Hamiltonian-

Applications of Hamilton's equations of motion - Simple pendulum - Compound pendulum – linear harmonic oscillator, Principle of least action – Proof of Principle of least action

UNIT- V

Relativity*

Frames of references – Negative result of Michelson Morley experiment – postulates of special theory of relativity – Galilean and Lorentz transformation – Length contraction – Time dilation and relativistic variation of mass with velocity – Addition of velocity – Einstein's mass energy equivalence

Books for study:

1. Mechanics and mathematical methods by R Murugesan, S Chand & Co. Pvt. Ltd., New Delhi, 1990
2. Elements of mechanics by Gupta
3. M. Narayanamurti and Nagarajan, Dynamics, National Publication Company, 8th Edition, 2002,
4. Classical Mechanics by Gupta Kumar and Sharma,
5. Classical Mechanics by B D Gupta and SathyaPrakash, KedarNath Ram Nath & Co.,
6. S.G. Venkatachalapathy, Mechanics, MArgham Publicataion, 2003.

Books for Reference:

1. Mechanics by D S Mathur
2. Classical Mechanics by Goldstein, Narosa

***Note: Compulsory problem from UNIT II and V in section B**

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYPR31	MAIN PHYSICS PRACTICAL -III	3	CC08	4

LIST OF EXPERIMENTS

1. Young's modulus-Uniform Bending-Pin & Microscope.
2. Young's modulus-Cantilever-Depression- Static method-Scale and Telescope.
3. Rigidity modulus – Static Torsion.
4. Melde's string –Determination of frequency of a fork .
5. Sonometer-Determination of AC Frequency –steel wire.
6. Spectrometer - i-d curve –Determination of R.I of the material of the prism
7. Potentiometer - Calibration of low range ammeter.
8. Air wedge- Determination of thickness of a thin wire.
9. Determination of M and B_H -Tan A position –Deflection and Vibration magnetometer.
10. Construction and study of low range power pack using two diodes.
11. Study of Analog and Digital multimeter (Testing of resistors, capacitors and diodes).
12. Figure of Merit of a Table galvanometer.

SEMESTER III
(ALLIED MATHEMATICS PAPER FOR PHYSICS)
(Common to both Allied Physics and Chemistry students for code U5PYAL31 &U5CHAL32)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAL31	ALLIED MATHEMATICS – I	6	CC09	7

Objectives: To explore the fundamental concept of Mathematics.

UNIT – I: ALGEBRA

Partial Fractions – Binomial, Exponential and logarithmic Series (without Proof) – Summation and approximation.

UNIT –II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients –imaginary and Irrational roots – Solving equations with related roots –Formation of Equations– Equation whose roots are Symmetric functions of roots of a given equation by diminishing (or increasing) its roots by a constant – Reciprocal equations– Simple problems.

UNIT – III: MATRICES

Symmetric – Skew-symmetric – Orthogonal and Unitary matrices –Hermitian – Skew Hermitian –Rank of a matrix (upto order 4) – Consistency of equations – Eigen roots and eigen vectors – Cayley-Hamilton theorem (without proof) – verification – Computation of inverse matrix.

UNIT – IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ –Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

UNIT – V: DIFFERENTIAL CALCULUS

The n th derivatives – Leibnitz theorem (without proof) and applications – Jacobians – Polar coordinates – Curvature and radius of curvature in Cartesian and Polar co-ordinates.

RECOMMENDED TEXT:

ALLIED MATHEMATICS, *P. Duraipandian and S. Udayabaskaran*, (1997), Vol. I & II, Muhil Publishers, Chennai.

REFERENCES:

1. ANCILLARY MATHEMATICS, *P.Balasubramanian and K.G. Subramanian*, (1997), Vol. I & II, Tata McGraw Hill, New Delhi.
2. ALLIED MATHEMATICS, *S.P. Rajagopalan and R. Sattanathan*, (2005), Vol. I & II, Vikas Publications, New Delhi.
3. ALLIED MATHEMATICS, *P. Kandasam and, K. Thilagavathy*, (2003), Vol. I & II, S.Chand & Company, New Delhi.

SEMESTER III
(ALLIED MATHEMATICS PRACTICAL PAPER FOR PHYSICS)
(Common to both Allied Physics and Chemistry students for code U5PYAP31 &U5CHAP32)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAP31	ALLIED PRACTICAL – COMPUTATIONAL MATHEMATICS I	1	AEC3	2

1. Solution of system of linear equations.
2. Solution of quadratic equations.
3. Calculation of interest tables.
4. Finding HCF and LCM.
5. Calculation of Profit and Loss.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PY4001	OPTICS	5	CC10	5

***Objectives:** To make the students to understand the dual nature of light through the concepts of Geometrical and Physical Optics. To introduce important applications of interference, diffraction and polarization of light*

UNIT-I: Aberration

Convex and Concave lens – Optic center – Cardinal points – spherical aberration – methods of minimizing spherical aberration – condition for minimum spherical aberration in the case of two lenses separated by a distance – chromatic aberration in lenses – condition for achromatism of two thin lenses in contact and out of contact –Coma- Astigmatism and distortion (concept only)- Eye piece- Ramsden's and Huygen's Eye pieces.

UNIT-II: Dispersion

Dispersion produced by a thin prism – angular dispersion – Dispersive power – Direct vision spectroscopy-combination of prisms to produce- dispersion without deviation – deviation without dispersion – achromatic prism – constant deviation spectrometer – determination of refractive index of the material of the small angled prism – Irrational dispersion – Haloes – Cauchy's formula.

UNIT- III: Interference*

Relation between Phase and Path difference- Coherent sources – condition for sustained interference of light wave- Theory of young's double slit experiment - colors of thin films – Reflected system – Air wedge – theory – Determination of diameter of a thin wire experimentally – test for optical flatness – Michelson's Interferometer – theory – Determination of wavelength and resolution of spectral lines – Newton's ring- Newton's ring by reflected system of light (Theory) – Determination of wavelength of sodium light using Newton's ring.

UNIT- IV: Diffraction*

Zone plate – construction - comparison of zone plate with convex lens - diffraction at circular aperture, straight edge – Fraunhofer diffraction at single and double slits – Plane diffraction grating –Theory- Determination of wavelength – Dispersive power of a grating – Difference between prism and grating – Resolving power of a prism and grating.

UNIT-V: Polarization

Brewster's law- Malus law – double refraction – Nicol Prism – construction and working- Nicol prism as a polarizer and analyzer – Huygen's explanation of double refraction in uniaxial crystals –Production , detection and theory of plane, circularly and elliptically polarized light – optical activity – Fresnel's explanation – specific rotatory power – Determination of specific rotatory power by Laurent's half shade Polari meter – Kerr and Faraday effect.

Books for Study:

1. Optics by Subramaniam N &BrijLal,- A text book of optics - S Chand & Co. Pvt. Ltd., New Delhi, 2010
2. Optics and Spectroscopy by Murugesan. - S Chand & Co. Pvt. Ltd., New Delhi. 5th Edition 2005

Books for Reference:

1. Optics by Khanna D R &Gulati H R, R Chand & Co. Pvt. Ltd., New Delhi, 1979
2. C.L Arora – Optics – S. Chand & Co. Pvt. Ltd., New Delhi. 1st Edition
3. Ajay Ghatak – Optics – McGraw Hill , 3rd Edition, 1996
4. G. Aruldas – Molecular structure and spectroscopy – Printice Hall India, 2nd Edition, 2008

***Note: Compulsory problem from UNIT III and IV in section B**

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYPR41	MAIN PHYSICS PRACTICAL-IV	3	CC11	4

LIST OF EXPERIMENTS

1. Young's modulus-Uniform Bending –Scale and Telescope.
2. Young's modulus-Cantilever - Depression-Dynamic method- Pin and Microscope.
3. Compound pendulum –Determination of 'g' and 'K'.
4. Sonometer –Determination of AC Frequency –Brass wire.
5. Spectrometer –Grating - Minimum deviation position-determination of N and λ .
6. Potentiometer –Determination of resistance and specific resistance of a coil.
7. Air wedge –Determination of thickness of enamel coating.
8. Determination of M and B_H –Tan B Position –Deflection and Vibration magnetometer.
9. Construction and study of regulated power supply using Zener diode.
10. Construction and study of regulated power supply using IC (7805).
11. Study of Analog and Digital Multimeter (Testing of transistors and fault finding in power supply)
12. Comparison of Two Capacitances –Ballistic Galvanometer.

SEMESTER IV
(ALLIED MATHEMATICS PAPER FOR PHYSICS)
(Common to both Allied Physics and Chemistry students for code U5PYAL41 &U5CHAL42)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAL41	ALLIED MATHEMATICS – II	6	CC12	7

Objectives: To Explore the Fundamental Concept of Mathematics.

UNIT– I: INTEGRAL CALCULUS

Properties of definite integrals –Integration by parts – Reduction formulae –Simple Problems.

UNIT – II: PARTIAL DIFFERENTIAL EQUATIONS

Formation – Complete integrals and general integrals – Four standard types, Lagrange's equation.

UNIT –III: LAPLACE TRANSFORMS

Laplace Transformations of standard functions and simple properties – Inverse Laplace transforms – Applications of solutions of linear differential equations of order 1 and 2 – simple problems.

UNIT – IV: VECTOR ANALYSIS

Scalar point functions – Vector point functions – Gradient, divergence and curl – Directional derivatives –Line, Surface and Volume integrals – Guass, Stoke's and Green's theorems (without proofs)– Simple problem based on these theorems.

UNIT – V : FINITE DIFFERENCES AND OPERATORS

First and Higher order differences – Forward and Backward difference – Properties of operators – Difference of a polynomial – Factorial polynomials – Operator E– Relation between Δ , ∇ and E.

RECOMMENDED TEXT:

ALLIED MATHEMATICS, *P. Duraipandian and S. Udayabaskaran*, (1997), Vol. I & II, Muhil Publishers, Chennai.

NUMERICAL ANALYSIS, *B.D. Gupta*, (2001), Konark Pub. Ltd., Delhi.

REFERENCES:

1. ANCILLARY MATHEMATICS, *P.Balasubramanian and K.G. Subramanian*, (1997), Vol. I & II, Tata McGraw Hill, New Delhi.
2. ALLIED MATHEMATICS, *S.P. Rajagopalan and R. Sattanathan*, (2005), Vol. I & II, Vikas Publications, New Delhi.
3. ALLIED MATHEMATICS, *P. Kandasamy and K. Thilagavathy*, (2003), Vol. I & II, S.Chand & Company, New Delhi.

SEMESTER IV
(ALLIED MATHEMATICS PRACTICAL PAPER FOR PHYSICS)
(Common to both Allied Physics and Chemistry students for code U5PYAP41 &U5CHAP42)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAP41	ALLIED PRACTICAL-COMPUTATIONAL MATHEMATICS II	1	AEC4	2

1. Finding area of two dimensional figures.
2. Finding volume of three dimensional figures.
3. Finding number of days between two given dates.
4. Calculation of continuous discounts.
5. Drawing graphs.

**SYLLABUS
For
M.Sc. PHYSICS**

**SEMESTERS – III & IV
(UNDER CBCS)**

2016-2017

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY1001	MATHEMATICAL PHYSICS	4	5

Objective: To provide an insight into tensors, complex analysis, transforms techniques, Differential equations and Greens function which form the backbone of all higher physics and to apply these techniques to solve Physics problems

UNIT- I: LINEAR VECTOR SPACES AND TENSORS

Linear operators – Representation of vectors and operators in a basis – Linear independence, dimension – Inner Product – Schwartz inequality – Orthonormal basis – Gram –Schmidt Process.

Tensors: Definition of scalars – Contravariant Vectors and Covariant Vectors – Einstein's summation convention – Definition of tensors – Second rank Cartesian tensor as operator – Symmetric and antisymmetric tensors.

UNIT -II: LINEAR DIFFERENTIAL EQUATIONS

Second order linear differential equations – Wronskian - Sturm- Liouville theory - Orthogonality of eigenfunctions - Illustration with Legendre, Laguerre, and Hermite differential equations – generating function- recurrence relation- Rodrigue formula – Expansion of polynomials.

UNIT -III: COMPLEX VARIABLES

Functions of a complex variable - Single and multivalued functions - Analytic functions - Cauchy - Riemann conditions - Singular points - Cauchy's theorem and integral formulae - Taylor and Laurent expansions - Zeros and poles - Residue theorem and its applications

UNIT-IV: LAPLACE, FOURIER TRANSFORMS AND GREEN'S FUNCTION

Laplace transforms - Solution of linear differential equations with constant coefficients - Fourier integral - Fourier transforms (Infinite), Fourier sine and cosine transforms - Convolution theorems.

One-dimensional Green's function - Eigenfunction expansion of the Green's function - Reciprocity theorem - Sturm - Liouville type equations in one dimension and their Green's functions.

UNIT- V: GROUP THEORY

Definition of groups, subgroups and conjugate classes - Symmetry elements transformation, Matrix representation - point groups - representation of group - reducible and irreducible representations Schur's lemmas- Orthogonality theorem - character of a representation - character table C_{2v} and C_{3v} - Application to infrared and Raman active vibrations of XY_3 type molecules.

BOOKS FOR STUDY:

1. **P. K. Chattopadhyay**, 1990, *Mathematical Physics*, Wiley Eastern, Madras.
2. **G. Arfken and H. J. Weber**, 2001, *Mathematical Methods for Physicists*, 5th Edition, Harcourt (India), New Delhi.
3. **A. W. Joshi**, 1997, *Elements of Group Theory for Physicists*, 4th Edition, New Age International, New Delhi.
4. **A. W. Joshi**, 1995, *Matrices and Tensors in Physics*, 3rd Edition, Wiley Eastern, Madras.
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.

BOOK 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
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY1002	CLASSICAL MECHANICS AND RELATIVITY	4	5

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 ad to create an understanding of their applications

UNIT-I: Lagrangian Formulations

Mechanics of a system of particles - Constraints - Lagrange's equations of motion - velocity dependent potentials - variation principle - Hamilton's principle - Non- holonomic system - conservation theorems and symmetry properties - Principle of least action-Two-body central force problem -Kepler Problem and Kepler's laws

UNIT-II: Mechanics of Rigid Bodies

Rigid body motion - Kinematics - Euler angles - Infinitesimal rotations - principal axes - Coriolis force - Dynamics - Angular momentum and rotational kinetic energy - Moment of inertia tensor - Euler's equations of motion - Poincot method - Symmetrical top.

UNIT-III: Hamilton's Formulation

Legendre transformation and Hamiltonian equations - Cyclic coordinates and conservation theorems - Hamiltonian equations from Variational principle - Canonical transformations - simple examples - Poisson brackets - equation of motion - Hamilton-Jacobi equation - Action and Angle variables - Application to harmonic oscillator problem.

UNIT-IV: Small Oscillations

Small Oscillations – Normal mode - Diatomic molecule - Formulation of the problem - double pendulum - Transformation to normal coordinates - Frequencies of normal modes - Linear triatomic molecule.

UNIT- V: Relativity

Review of basic ideas of special relativity – Energy momentum four vector – Minkowski's four dimensional space – Lorentz transformation as rotation in Minkowski's space – Equation of force in relativistic mechanics in terms of Variation of mass with velocity and mass energy relation – Elements of general theory of relativity.

BOOKS FOR STUDY:

1. **H. Goldstein**, 2002, *Classical Mechanics*. 3rd Edition, C. Poole and J. Safko, Pearson Education, Asia, New Delhi.
2. **B.D Gupta and Satya Prakash**, 1997, *Classical Mechanics* 5th Edition. Kedarnath Ramath, Meerut and New Delhi.
3. **S. N. Biswas**, 1998, *Classical Mechanics*, Books and Allied Ltd., Kolkata.
4. **Upadhyaya**, 1999, *Classical Mechanics*, Himalaya Publishing Co., New Delhi.
5. **P. V, Panat**, 2005 *Classical Mechanics* 5th Edition alpha Science International.
6. **R. Douglas Gregory**, 2006 *An Undergraduate Text of Classical Mechanics*, Cambridge University Press .

BOOKS FOR REFERENCE:

1. **D. Landau and E. M. Lifshitz**, 1969, *Mechanics*, Pergomon Press, Oxford.
2. **K. R. Symon**, 1971, *Mechanics*, Addison Wesley, London.
3. **J. L. Synge and B. A. Griffith**, 1949, *Principles of Classical Mechanics*, Mc Graw-Hill, New York.
4. **C. R. Mondal**, *Classical Mechanics*, Prentice-Hall of India, New Delhi.
5. **R. Resnick**, 1968, *Introduction to Special Theory of Relativity*, Wiley Eastern, New Delhi.
6. **R. P. Feynman**, 1962, *Quantum Electrodynamics*, Benjamin, Reading, MA.
7. M. Glazer and J. Wark, 2001, *Statistical Mechanics*, Oxford University Press, Oxford.

**SEMESTER I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY1003	QUANTUM MECHANICS I	4	5

***Objective:** To provide an understanding of fundamental principles of quantum mechanics and to introduce to the basic ideas of Dirac formulation, Time-independent perturbation theory, and approximation methods in Quantum Mechanics.*

UNIT-I: BASIC FORMALISM

Interpretation and conditions on the wave function - Postulates of quantum mechanics and the Schroedinger equation - Ehrenfest's theorem- Stationary states-Linear operators and self adjoint operators, Expectation values- Orthonormality - Hermitian operators for dynamical variables - Eigenvalues and eigenfunctions - Uncertainty principle - Illustrations.

UNIT-II: ONE AND THREE DIMENSIONAL PROBLEMS

Particle in a box - Square-well potential - Barrier penetration - Simple harmonic oscillator - Ladder operator method - Rigid Rotator.

Orbital angular momentum and spherical harmonics - Central forces and reduction of two-body problem - Particle in a spherical well - Hydrogen atom.

UNIT-III: GENERAL FORMALISM

Hilbert space - Dirac notation - Representation theory - Co-ordinate and momentum representations - Time evolution - Schroedinger, Heisenberg and Interaction pictures- Symmetries and conservation laws - Unitary transformations associated with translations and rotations - Parity and time reversal.

UNIT-IV: APPROXIMATION METHODS

Time-independent perturbation theory for non-degenerate and degenerate levels - Variation method, simple applications - WKB approximation - Connection formulae (no derivation) - WKB quantization rule - Application to simple harmonic oscillator - Hydrogen molecule, covalent bond and hybridization.

UNIT-V: ANGULAR MOMENTUM AND IDENTICAL PARTICLES

Eigenvalue spectrum from angular momentum algebra - Matrix representation - Spin angular momentum - Non-relativistic Hamiltonian including spin - Addition of angular momenta - Clebsch - Gordan Coefficients.

Symmetry and anti-symmetry of wave functions – construction - Pauli's spin matrices.

BOOKS FOR STUDY:

1. **P. M. Mathews** and **K. Venkatesan**, 1976, *A Text book of Quantum Mechanics*, Tata McGraw-Hill, New Delhi.
2. **L. I. Schiff**, 1968, *Quantum Mechanics*, 3rd Edition, International Student Edition, MacGraw-Hill Kogakusha, Tokyo.
3. **V. Devanathan**, 2005, *Quantum Mechanics*, Narosa Publishing House, New Delhi.

BOOKS FOR REFERENCE:

1. **E. Merzbacher**, 1970, *Quantum Mechanics* 2nd edition, John Wiley and Sons, New York.
2. **P. A. M. Dirac**, 1973, *The Principles of Quantum Mechanics*, Oxford University Press, London.
3. **L. D. Landau** and **E. M. Lifshitz**, 1976, *Quantum Mechanics* Pergamon Press, Oxford.
4. **S. N. Biswas**, 1999, *Quantum Mechanics*, Books And Allied Ltd., Kolkata.
5. **G. Aruldhas**, 2002, *Quantum Mechanics*, Prentice Hall of India, New Delhi.
6. **A. Ghatak** and **S. Lokanathan**, *Quantum Mechanics: Theory and Applications*, 4th Edition, Macmillan India.
7. **J. S. Bell**, **Gottfried** and **M. Veltman**, 2001, *The Foundations of Quantum Mechanics* World Scientific, Singapore.
8. **R. P. Feynman**, **R. B. Leighton**, and **M. Sands**, 1998, *The Feynman Lectures on Physics*, Vols. 3, Narosa, New Delhi.

**SEMESTER I
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYPR11	PRACTICAL I- GENERAL PHYSICS EXPERIMENTS I	4	6

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 – Thermister.
5. Hydrogen spectrum – Rydberg's.
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 are spectrum.
12. Brass /Alloy are 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 harding coefficient.
20. Thickness of the enamel coating on a wire – by diffraction.
21. Lasers - Study of laser beam parameters.
22. Measurement of Numerical aperture (NA) of a telecommunication graded optic fibre.
23. Fibre attenuation of given optical fibre.
24. Determination of solar constant.
25. Biprism – Wavelength of monochromatic source – Refractive index of a liquid.

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYE101	ELECTRONIC DEVICES AND APPLICATIONS	4	3

Objective: to provide an exposure to the wide application of integrated circuit logic, Optoelectronics devices, Operational amplifiers, 555timer, Phase Locked Loop and Pulse related communication circuits.

UNIT-I: FABRICATION OF IC AND LOGIC FAMILIES

Fabrication of IC – Monolithic integrated circuit fabrication- IC pressure transducers – Monolithic RMS –Voltage Measuring device – Monolithic voltage regulators – Integrated circuit multipliers – Integrated circuit logic – Schottky TTL – ECL – I² L – P and NMOS Logic – CMOS logic – Tristate logic circuits.

UNIT II: OPTO ELECTRONIC DEVICES

Basics of Photometry - Light sources and Displays - Light emitting Diodes – Surface emitting LED – Edge emitting LED – Seven segment display – Organic LED (OLED) – LDR – Diode lasers – Photo detectors – CCD - Basic parameters – Photo diodes – p-i-n - Photo diode – Photo transistors – IR and UV detectors.

UNIT- III: 555 TIMER AND ITS APPLICATIONS

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

Instrumentation amplifier – V to I and I to V converter – Op-amp circuits using diodes – Sample and hold circuits – Log and Antilog amplifiers – Multiplier and Divider – Electronic analog computation – Schmitt Trigger – Astable, Monostable Multivibrator – Triangular wave generators – Sine wave generators – RC Active filters.

UNIT- V: PULSE RELATED DIGITAL COMMUNICATION

Pulse communications – Introduction – Types – Pulse – Amplitude Modulation [PAM] – Pulse Time modulation – Pulse Width Modulation [PWM] – Pulse Position Modulation [PPM] – Pulse Code Modulation [PCM] – Principles of PCM – Quantizing noise – Generation and Demodulation of PCM – Effects of noise – Advantages and applications of PCM – Pulse systems – Telegraphy – Frequency –shift keying.

Books for Study:

1. S.M.Sze, 1985, Semiconductor Devices – Physics and Technology, Wiley, New York.
2. Milman and Halkias, Integrated Electronics, Mc-Graw – Hill, New Delhi.
3. R.A.Gaekwad, 1994, Op-Amps and integrated circuits EEE.
4. Taub and Shilling, 1983, Digital Integrated Electronics, McGraw Hill, New Delhi.
5. J.Millman, 1979, Digital and Analog Circuits and Systems, McGraw Hill, London.
6. 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 Semi conductor Devices, Wiley, New York.
3. P.Bhattacharya, 2002, Semiconductor Optoelectronic Devices, 2nd Edition, Prentice Hall of India, New Delhi.
4. D.Roy Choudhury, 1991, Linear Integrated circuits, Wiley Eastern, New Delhi.

SEMESTER I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYE102	COMPUTATIONAL METHODS AND PROGRAMMING	4	3

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 - 1: SOLUTIONS OF EQUATIONS

Determination of zeros of polynomials - Roots of nonlinear algebraic equations and transcendental equations - Bisection and Newton-Raphson methods - Convergence of solutions.

UNIT - 2: LINEAR SYSTEMS

Solution of simultaneous linear equations - Gaussian elimination - Matrix inversion - Eigenvalues and eigenvectors of matrices - Power and Jacobi Methods.

UNIT - 3: INTERPOLATION AND CURVE FITTING

Interpolation with equally spaced and unevenly spaced points (Newton forward and backward interpolations, Lagrange interpolation) - Curve fitting - Polynomial leastsquares fitting - Cubic spline fitting.

UNIT- 4: DIFFERENTIATION, INTEGRATION AND SOLUTION OF DIFFERENTIAL EQUATIONS

Numerical differentiation - Numerical integration - Trapezoidal rule - Simpson's rule - Error estimates - GaussLegendre, Gauss-Legendre, Gauss-Hermite and GaussChebyshev quadratures - Numerical solution of ordinary differential equations - Euler and Runge Kutta methods

UNIT - 5 : PROGRAMMING WITH FORTRAN / C

Flow-Charts - Integer and floating point arithmetic expressions - Built-in functions - Executable and nonexecutable statements - Subroutines and functions - Programs for the following computational methods : (a) Zeros of polynomials by the bisection method, (b) Zeros of polynomials/non-linear equations by the Newton-Raphson method, (c) Lagrange Interpolation, (d) Trapezoidal and Simpson's Rules, (e) Solution of first order differential equations by Euler's Method.

BOOKS FOR STUDY

1. Sastry, Introductory Methods of Numerical Analysis.
2. V. Rajaraman, Computer Oriented Numerical Methods, 3rd Ed. (Prentice-Hall, New Delhi, 1993). 42 D:rainbow\B.A.\Tamil\less 1,2,5,12,17proof.pmd
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

1. 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).

SEMESTER-II
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY2001	STATISTICAL PHYSICS	5	5

Objective: 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: THERMODYNAMICS AND PHASE TRANSITION

First law, second law Entropy – consequences of second law-Thermodynamic potentials- Third law- Phase equilibria- Gibb's phase rule- transition and Ehrenfest classification (I & II ORDER) Landau's theory of phase transition-critical indices-scale transformation and dimension analysis.

UNIT-II: ENSEMBLES

Micro and macro states- Boltzman's relation-phase space trajectories- density of states- Liouville's theorem- postulate of statistical mechanics - Ensembles micro, canonical and grand canonical ensembles - evaluation of thermodynamic quantities from partition functions, relation between canonical and grand canonical partition function-Energy and density fluctuation-canonical partition function for an ideal gas- Gibbs paradox and its resolution.

UNIT-III: BOSE-EINSTEIN STATISTICS

Ideal Bose gas – Thermodynamic properties – statistics of ensembles – black body radiation – phonons – Debye's theory of specific heat – BE condensation – Liquid helium – super fluidity.

UNIT-IV: FERMI DIRAC STATISTICS

Ideal Fermi gas – Fermi Dirac distribution – thermodynamic properties – electron in metals – electronic heat capacity – Pauli's paramagnetic susceptibility – white dwarf – Chandrasekhar limit – nuclear matter

UNIT- V: ISING MODEL AND FLUCTUATIONS

Ising model- mean field theories- exact solution of Ising model in one dimension-matrix method- correlation of space time dependent fluctuations- fluctuations and transport phenomena- Brownian motion- ILangevin theory- Fluctuation- Dissipation theorem- The Fokker –plank equation.

BOOKS FOR STUDY:

1. B.K. Agarwal and M. Eisner, 1998, Statistical Mechanics, 2nd Edition, New Age International, New Delhi.
2. Sathya Prakash and J.P Agarwal, 1994, Statistical Mechanics, 7th Edition, Kedar Nath and Ram Nath & Co, Meerut.
3. J.K.Bhattacharjee, 1996, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi.
4. S.K.Sinha Statistical Mechanics, theory and application Tata MAcgraw Hill.

BOOKS FOR REFERENCE

1. K. Huang, 1975, Statistical Mechanics, Wiley Eastern Ltd., New Delhi.
2. H.B.Callen, John Wiley Thermodynamics and An Introduction to Thermostatic

SEMESTER-II
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY2002	ELECTROMAGNETIC THEORY	5	6

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

Boundary value problems and Laplace equation – Boundary conditions and uniqueness theorem – Laplace equation in three dimension – Solution in Cartesian and spherical polar co ordinates – Examples of solutions for boundary value problems.

Polarization and displacement vectors - Boundary conditions - Dielectric sphere in a uniform field – Molecular polarisability and electrical susceptibility – Electrostatic energy in the presence of dielectric – Multipole expansion.

UNIT- II: MAGNETOSTATICS

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 - Magnetostatic energy - Magnetic induction and magnetic field in macroscopic media - Boundary conditions - Uniformly magnetised sphere.

UNIT- III: MAXWELL EQUATIONS

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 - Energy and

momentum of the field - Poynting's theorem - Lorentz force - Conservation laws for a system of charges and electromagnetic fields.

UNIT- IV: APPLICATION OF MAXWELL'S EQUATIONS

Fields and radiation of localized sources - Oscillating electric dipole - Radiation from an Oscillating electric dipole - Poynting vector and radiated power - Radiation resistance - Radiation from a linear antenna - Antenna arrays - Radiation pressure and electromagnetic momentum - Electromagnetic Oscillators.

UNIT- V: GUIDED WAVES

Essential conditions for guided waves - TEM waves in coaxial cables - TE waves - rectangular wave guide -electric and magnetic fields on the surface and inside rectangular wave guide - TE and TM waves in rectangular wave guide - cut - off frequency and wavelength - circular waveguides - energy flow and attenuation in wave guides - cavity resonators - phase and group velocity

BOOKS FOR STUDY:

1. **D. J. Griffiths**, 2002, *Introduction to Electrodynamics*, 3rd Edition, Prentice-Hall of India, New Delhi.
2. **J. R. Reitz, F. J. Milford and R. W. Christy**, 1986, *Foundations of Electromagnetic Theory*, 3rd edition, Narosa Publication, New Delhi.
3. **J. D. Jackson**, 1975, *Classical Electrodynamics*, Wiley Eastern Ltd. New Delhi.
4. **J. A. Bittencourt**, 1988, *Fundamentals of Plasma Physics*, Pergamon Press, Oxford.

BOOKS FOR REFERENCE:

1. **W. Panofsky and M. Phillips**, 1962, *Classical Electricity and Magnetism*, Addison Wesley, London.
2. **J. D. Kraus and D. A. Fleisch**, 1999, *Electromagnetics with Applications*, 5th Edition, WCB McGraw-Hill, New York.
3. **B. Chakraborty**, 2002, *Principles of Electrodynamics*, Books and Allied, Kolkata.
4. **R. P. Feynman, R. B. Leighton and M. Sands**, 1998, *The Feynman Lectures on Physics*, Vols. 2, Narosa, New Delhi.

SEMESTER-II
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PY2003	QUANTUM MECHANICS- II	4	6

Objective: 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: SCATTERING THEORY

Scattering amplitude - Cross sections - Born approximation - Partial wave analysis -Effective range theory for S-wave - Transformation from centre of mass to laboratory frame - Phase shift -scattering length and effective range - Low energy scattering.

UNIT-II: PERTURBATION THEORY

Time dependent perturbation theory - Constant and harmonic perturbations - Transition probabilities - Adiabatic approximation - Sudden approximation - The density matrix - Spin density matrix and magnetic resonance - Semi-classical treatment of an atom with electromagnetic radiation - Selection rules for dipole radiation.

UNIT-III: RELATIVISTIC QUANTUM MECHANICS

Klein-Gordon equation - Dirac equation - Plane-wave solutions - Interpretation of negative energy states - Antiparticles - Spin of electron - Magnetic moment of an electron due to spin - Energy values in a Coulomb potential.

UNIT-IV: DIRAC EQUATION

Covariant form of Dirac equation - Properties of the gamma Matrices - Traces -Relativistic invariance of Dirac equation – Probability density-current four vector – Bilinear covariants - Feynman's theory of positron (Elementary ideas only without propagation formalism).

UNIT-V: SECOND QUANTIZATION

Second quantization of Klein-Gordon field - Creation and annihilation operators - Commutation relations - Quantization of electromagnetic field - Quantization of Schrodinger's and Dirac field.

BOOKS FOR STUDY:

1. **P. M. Mathews** and **K. Venkatesan**, 1976, *A Text book of Quantum Mechanics*, Tata McGraw-Hill, New Delhi.
2. **L. I. Schiff**, 1968, *Quantum Mechanics*, 3rd Edition, International Student Edition, MacGraw-Hill Kogakusha, Tokyo.
3. **E. Merzbacher**, 1970, *Quantum Mechanics*, 2nd edition, John Wiley and Sons, New York.
4. **V. K. Thankappan**, 1985, *Quantum Mechanics*, 2nd Edition, Wiley Eastern Ltd, New Delhi.
5. **J.D. Bjorken** and **S.D. Drell**, 1964, *Relativistic Quantum Mechanics*, MacGraw-Hill New York.
6. **V. Devanathan**, 2005, *Quantum Mechanics*, Narosa Publishing House, New Delhi.
7. S.L. Gupta and I.D.Gupta - Quantum Mechanics.

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.

**SEMESTER-II
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYPR21	PRACTICAL II-ELECTRONICS EXPERIMENTS	4	6

LIST OF EXPERIMENTS

(Any 15 out of the given 25)

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 Monostable multivibrator.
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 - Astable multivibrator and Voltage Controlled Oscillator.
17. IC 555 - Monostable multivibrator, Frequency Divider.
18. IC 555 - Schmitt Trigger and Hysteresis.
19. IC 7400 & IC 7413 - Clock generators.
20. Temperature co-efficient using 555 timers.
21. Instrumentation Amplifier - using four IC 741.
22. Pulse width modulator using IC 741.
23. A/D converter using comparator LM 336.
24. Phase locked loop.

SEMESTER-II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYE201	ADVANCED SPECTROSCOPY	4	6

Objective: To expose to the fundamental principles of various spectroscopic techniques for structural applications.

UNIT-I: INFRARED SPECTROSCOPY

Vibrations of diatomic and simple polyatomic molecules - Anharmonicity - Fermi Resonance - Hydrogen Bonding - Normal Modes of Vibration in a crystal - Solid State Effects - Interpretation of Vibrational Spectra - Instrumentation techniques - FTIR spectroscopy

UNIT-II: RAMAN SPECTROSCOPY

Vibrational and Rotational Raman spectra - Mutual Exclusion principle - Raman spectrometer - Polarization of Raman Scattering light. Structure Determination through IR and Raman spectroscopy - Phase transitions - Resonance Raman Scattering

UNIT-III: NMR AND NQR SPECTROSCOPY

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-IV: ESR AND MOSSBAUER SPECTROSCOPY

Quantum Theory of ESR - Design of ESR Spectrometer - Hyperfine Structure - Anisotropic systems - Triplet state study of ESR - Applications - Crystal defects - Biological studies

Mossbauer effect – Recoilless emission and absorption – Mossbauer spectrum – Experimental methods – Mossbauer spectrometer- Hyperfine interactions – Chemical Isomer shift.

UNIT-V: LASER SPECTROSCOPY

Non linear optical effects- frequency generation by NOT- sources – Supersonic beams and jet cooling – hyper Raman effect- stimulated Raman scattering- Inverse Raman Scattering- Coherent anti stoke Raman Scattering- Photo acoustic Raman Scattering – LMR.

BOOKS FOR STUDY:

1. **C. N. Banwell** and **E. M. McCash**, 1994, Fundamentals of Molecular Spectroscopy, 4th Edition TMH, New Delhi.
2. **G. Aruldas**, 2001, Molecular Structure and Spectroscopy, Prentice Hall of India Pvt. Ltd. New Delhi.
3. **D. N. Satyanarayana**, 2004, Vibrational Spectroscopy and Applications, New Age International Publication
4. **Gurdeep Chatwal & Sham Anand**, Spectroscopy (Atomic and Molecular) Himalaya Publishing house

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, Mc Graw-Hill International
4. **Raymond Chang**, 1980, Basic Principles of Spectroscopy Mc Graw-Hill Kogakusha, Tokyo.

SEMESTER-II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6PYE202	ASTROPHYSICS	4	6

***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: STELLAR STRUCTURE AND EVOLUTION

Star formation, Stellar Magnitudes, Classification of stars, H-D classification, Saha Equation of ionization, Hertzsprung-Russel (H-R) diagram. i) Gravitational energy, Virial theorem, Equations of stellar structure and evolution. ii) Pre-main sequence evolution, Jeans criteria for star formation, fragmentation and adiabatic contraction, Evolution on the main sequence, Post main sequence evolution, Polytopic Models: Lane-Emden equation, simple stellar models: Eddington's model and Homologous model, Convective and Radiative stars, Pre-main sequence contraction: Hayashi and Henyey tracks.

UNIT- II: NUCLEAR ASTROPHYSICS

Thermonuclear reactions in stars, pp chains and CNO cycle, Solar Neutrino problem, subsequent thermonuclear reactions, Helium burning and onwards, nucleo synthesis beyond iron, r- and s- processes.

UNIT- III: STELLAR OBJECTS & STELLAR EXPLOSIONS

Qualitative discussions on: Galaxies, Nabulae, Quasars, Brown dwarfs, Red Giant Stars, Nova, Supernova.

UNIT-IV: GRAVITATIONAL COLLAPSE AND RELATIVISTIC ASTROPHYSICS

Newtonian theory of stellar equilibrium, White Dwarfs, Electron degeneracy and equation of States, Chandrasekhar Limit, Mass-Radius relation of WD.

Neutron Stars, Spherically symmetric distribution of perfect fluid in equilibrium. Tolman-Oppenheimer- Volkoff (TOV) equation, Mass-Radius relations of NS. Pulsars, Magnetars, Gamma ray bursts. Black holes, Collapse to a black hole (Oppenheimer and Snyder), event horizon, singularity.

UNIT-V: ACCRETION DISKS

Formation of Accretion Disks, Differentially rotation systems in Astrophysics, Disk dynamics, Steady Disks, Disk formation in close binary systems through mass transfer, Accretion onto compact objects (Black Holes and Neutron Stars).

BOOKS FOR STUDY

1. Textbook of astronomy and astrophysics with elements of cosmology, V.B.Bhatia, Narosa publishing house, 2001.
2. Astrophysics – Stars and Galaxies, K. D. Abhyankar, University Press, 2001.
3. Theoretical Astrophysics (Vols.I,II,III) – T. Padmanavan (CUP)
4. Black Holes, White Dwarfs and Neutron Stars – S.L.Shapiro and S.A.Teukolsky (John Wiley, 1983)

BOOKS FOR REFERENCE:

1. The Early Universe – E.W.Kolb and M.S.Turner (Addison-Wesley Reading, 1990)
2. Introduction to Cosmology – J.V.Narlikar (Cambridge University Press)
3. General Relativity, Astrophysics and Cosmology – A.K.Raychaudhuri, S.Banerji and A.Banerjee (Springer-Verlag, 1992)
4. General Relativity and Cosmology – S. Banerji and A. Banerjee (Elsevier, 2007)
5. The Structure of the Universe – J.V.Narlikar (OUP, 1978)

SYLLABUS
For
B.Sc. CHEMISTRY
SEMESTERS – III & IV
(UNDER CBCS)

2016-2017

**SEMESTER-III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CH3001	GENERAL CHEMISTRY III	7	CC07	7

OBJECTIVE:

Basic concepts regarding principles of inorganic analysis and applications of qualitative analysis, solvents, p-block, elements, group study, aromaticity, electrophilic and nucleophilic substitution reactions, elimination reactions, mechanism, thermodynamics, derivation of equations, related problems, applications wherever necessary.

UNIT-I

- 1.1 Principles of inorganic analysis – Reactions involved in the separation and identification of cations and anions in the analysis – Spot test reagent- Aluminon, Cupferon, DMG, Thiourea, Magneson, Alizarin and Nessler's reagent.
- 1.2 Semimicro techniques – Principles of acid-base equilibria – common ion effect – Solubility product and their applications in qualitative analysis.
- 1.3 Types of solvents – Physical properties of solvent – Protic and aprotic solvents – Amphi-protic / amphoteric solvent – aqueous and non-aqueous solvents – Liquid ammonia and Liquid SO₂ as solvent.

UNIT-II

- 2.1 Aromaticity – Modern theory of aromaticity – Huckel's (4n+2) rule and its simple applications – Aromatic hydrocarbons – Resonance in benzene – Delocalised cloud in benzene.
- 2.2 Electrophilic reagents – Electrophilic substitution reactions in aromatic compounds – General mechanisms – nitration – halogenation – sulphonation – Friedel-Craft's acylation and alkylation.
- 2.3 Aliphatic nucleophilic substitutions – Nucleophilic reagents – Mechanism of SN₁, SN₂ and SNi reactions – effects of structure of substrate – solvent – nucleophile and Leaving groups.

UNIT-III

- 3.1 Second law of thermodynamics – Need for the II law – Spontaneous process – Criteria of spontaneity – different forms of statements of the second law – Cyclic process – Heat engines.
- 3.2 Carnot's cycle – Efficiency – Carnot's theorem (Statement only) – Concept of entropy – Definition – Randomness and entropy – Numerical definition of entropy –

- 3.3 Standard entropy – Derivation of entropy from Carnot cycle – entropy change of an ideal gas during isothermal process – Entropy changes in cyclic – reversible and irreversible processes.

UNIT-IV

- 4.1 'p' block elements – Boron family – group discussion – anomalous behaviour of Boron – diagonal relationship between B and Si – Electron deficiency and electron acceptor behaviour of Boron trihalides – bonding (hydrogen-bridge structure) in diborane.
- 4.2 Directive influence – Orientation – Ortho / para ratio – Nuclear and side chain Halogenations
- 4.3 Entropy changes in physical transformations – Calculation of entropy changes with Changes in T,V and P – entropy of mixing of ideal gases.

UNIT-V

- 5.1 Carbon family – Group discussion – catenation – Comparison of properties of carbon and silicon valencies – oxides – halides – hydrides and oxy acids. Classification – preparation – properties and uses of carbides.
- 5.2 Elimination reactions – Bimolecular elimination reaction (E2) – Unimolecular Elimination reaction (E1) – mechanisms of E1 and E2 reactions – Hoffmann and Saytzeff's – Cis and trans eliminations
- 5.3 Free energy and work function – Gibb's free energy – Helmholtz work function – Their variations with temperature – pressure and volume – Criteria for spontaneity

REFERENCE:

1. Text book of Inorganic Chemistry by Puri & sharma.
2. Text book of Inorganic Chemistry by PL Sony.
3. Text book of Inorganic Chemistry by JD. Lee.
4. Text book of Organic Chemistry by PL Sony.
5. Text book of Organic Chemistry by Morison & Boyd.
6. Text book of Organic Chemistry by Bahl & Arunbahl.
7. Text book of Physical Chemistry by Puri & Sharma.
8. Text book of Physical Chemistry by PL Sony.
9. Thermo dynamics by Glasston & lewis.
10. Practical Inorganic Chemistry by Vogel.

SEMESTER-III
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHPR31	PRACTICAL III- COMPLEX PREPARATION AND ACID RADICAL ANALYSIS	1	CC08	2

OBJECTIVE:

Analysis of mixture containing three anions of which one will be an interfering ion. Semi-micro method using the conventional scheme to be adopted.

Anions to be Studied - I

Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

Preparation of Inorganic Compounds - II

1. Tetrammine copper II sulphate
2. Tris (thiourea) copper I chloride
3. Potassium trioxalato ferrate (II)
4. Chloropentammine cobalt (III) chloride
5. Ferrous ammonium sulphate
6. Microcosmic salt

ACID RADICALS	30 MARKS
PREPARATION	15 MARKS
RECORD	10 MARKS
VIVA VOCE	15 MARKS
PROCEDURE	<u>05 MARKS</u>
TOTAL	<u>75 MARKS</u>

REFERENCE:

1. Basic Principles of Practical Chemistry.
V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.

SEMESTER-III
(ALLIED ZOOLOGY PAPER FOR CHEMISTRY)
 (Common to both Chemistry and Biochemistry allied students for code
 U5BIAL31&U5CHAL31)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAL31	ALLIED ZOOLOGY I	6	CC09	7

Objective: To study the systematic and functional morphology of invertebrates and chordates.

UNIT 1

Protozoa -Structure and Life cycle of Plasmodium, Porifera– Canal system in Sponges and Economic importance, Coelenterata – Obelia structure-Colony , medusa-Polymorphism in obelia, Platyhelminthes-Taenia solium- structure, life cycle and Pathogenic effects.

UNIT 2

General characters, Structure and economical importance- Annelida-Earthworm, Mollusca-Fresh water mussel, Echinodermata-sea star.

UNIT 3

General characters and phylogenic significance- Affinities of prochordates and vertebrates, Morphology of Amphioxus , Balanoglossus

UNIT 4

Structure and system – Digestive, Nervous and Reproduction system of Shark& Frog.

UNIT 5

Structure and systemic study – Digestive, nervous, Respiratory and Reproductive system of Calotes, Pigeon and Rat.

Reference Books:

1. Invertebrate Zoology – Verma and Agarwal – S. Chand Publishers -2001
2. Chordate Zoology- Verma and Agarwal – S. Chand Publishers -2007
3. Invertebrate Zoology – Saras Publication 2010
4. Chordate Zoology – Saras Publication 2012
5. Comparative Chordate Zoology – Water man- 1970
6. Invertebrate Zoology – Nigam -1980
7. Chordate Zoology – Nigam- 1980

SEMESTER-III
(ALLIED ZOOLOGY PRACTICAL PAPER FOR CHEMISTRY)
 (Common to both Chemistry and Biochemistry allied students for code
U5BIAP31&U5CHAP31)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAP31	ALLIED ZOOLOGY PRACTICAL I	6	CC09	7

MODELS/SLIDES/SPOTTERS ONLY

Dissection Model:

Cockroach: Digestive, Nervous and Reproductive system.
 Frog : Digestive, Nervous and Urinogenital sytem

Minor Practical (Mounting Spotters):

1. Body setae of Earthworm.
2. Mouth parts of Mosquito.
3. Mouth parts of Honey Bee.

SPOTTERS:

1. Invertebrata

PROTOZOA - Euglena & Entamoeba histolytica, Plasmodium
 PORIFERA - Sycon
 COELENTERATA - Obelia
 PLATYHELMINTHES - Taenia Solium
 ASCHELMINTHES - Ascaris – Male and Female
 NEMATODA - Earth Worm
 MOLLUSCA - Pila, Fresh Water Mussel
 ARTHROPODA - Prawn
 ECHINODERMATA - Sea Star

2. Chordata

PROCHORDATA - Balanoglossus, Amphioxus
 PISCES - Shark, Electric ray fish, Hammer headed fish
 AMPHIBIA - Frog
 REPTILIA - Calotes Snakes-Cobra, Python
 AVES - Pigeon- Pigeon Quill Feather
 MAMALLIA - Rat.

Reference Books:

Practical Manual – Lab. Rastogi – Meerut 1980
 Practical Zoology – N. Armugam 198

SEMESTER III
(ALLIED MATHEMATICS PAPER FOR CHEMISTRY)
(Common to both Physics and Chemistry allied students for code U5PYAL31&U5CHAL32)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAL32	ALLIED MATHEMATICS – I	6	CC09	7

Objectives: To explore the fundamental concept of Mathematics.

UNIT – I: ALGEBRA

Partial Fractions – Binomial, Exponential and logarithmic Series (without Proof) – Summation and approximation.

UNIT –II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients –imaginary and Irrational roots – Solving equations with related roots –Formation of Equations– Equation whose roots are Symmetric functions of roots of a given equation by diminishing (or increasing) its roots by a constant – Reciprocal equations– Simple problems.

UNIT – III: MATRICES

Symmetric – Skew-symmetric – Orthogonal and Unitary matrices –Hermitian – Skew Hermitian –Rank of a matrix (upto order 4) – Consistency of equations – Eigen roots and eigen vectors – Cayley-Hamilton theorem (without proof) – verification – Computation of inverse matrix.

UNIT – IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ –Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

UNIT – V: DIFFERENTIAL CALCULUS

The n th derivatives – Leibnitz theorem (without proof) and applications – Jacobians – Polar coordinates – Curvature and radius of curvature in Cartesian and Polar co-ordinates.

RECOMMENDED TEXT:

ALLIED MATHEMATICS, *P. Duraipandian and S. Udayabaskaran*, (1997), Vol. I & II, Muhil Publishers, Chennai.

REFERENCES:

4. ANCILLARY MATHEMATICS, *P.Balasubramanian and K.G. Subramanian*, (1997), Vol. I & II, Tata McGraw Hill, New Delhi.
5. ALLIED MATHEMATICS, *S.P. Rajagopalan and R. Sattanathan*, (2005), Vol. I & II, Vikas Publications, New Delhi.
6. ALLIED MATHEMATICS, *P. Kandasam and, K. Thilagavathy*, (2003), Vol. I & II, S.Chand & Company, New Delhi.

SEMESTER III
(ALLIED MATHEMATICS PRACTICAL PAPER FOR CHEMISTRY)
(This paper is common to both Physics and Chemistry allied students for code U5PYAP31
&U5CHAP32)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5PYAP32	ALLIED PRACTICAL - COMPUTATIONAL MATHEMATICS I	1	AEC3	2

1. Solution of system of linear equations.
2. Solution of quadratic equations.
3. Calculation of interest tables.
4. Finding HCF and LCM.
5. Calculation of Profit and Loss.

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CH4001	GENERAL CHEMISTRY IV	5	CC10	5

Objective :

p-block elements & group study, aromatic nucleophilic substitution reactions, polyhydric alcohol, unsaturated alcohols, phenols, preparation properties, important name reactions, mechanism, thermodynamics, derivation of equations, partial molar properties, chemical potential, related problems, applications.

UNIT-I

- 1.1 'p' block elements – Nitrogen family – Comparative study of N,P,As,Sb and Bi – elements – oxides – oxyacids – halides and hydrides – valency states.
- 1.2 Oxygen family – Comparative study of O,S,Se and Te-elements-catenation – Oxides – halides – hydrides and oxy acids – anomalous behaviour of oxygen.
- 1.3 Oxy-acids of sulphur including Peroxy acids and Thionic acids.

UNIT-II

- 2.1 Aromatic nucleophilic substitutions – Unimolecular nucleophilic substitution – mechanism – Bimolecular nucleophilic substitution – mechanism.
- 2.2 Polyhydric alcohols – glycerol – Unsaturated alcohols – preparation – Properties and uses of allyl alcohol.
- 2.3 Phenols – acidic character of phenols – Kolbe's reaction, Reimer – Tiemann reaction, Gattermann, Lederer, Manasse and Houben – Hoesch reactions.

UNIT-III

- 3.1 Gibbs-Helmholtz equations – derivation and applications. Clausius - Clapeyron Derivation and Application.
- 3.2 Third law of thermodynamics – Entropy at absolute zero – Planck's formulation of third law – Nernst heat theorem – statement of III law of thermodynamics.
- 3.3 Evaluation of absolute entropy from heat capacity measurement - exceptions to III law – application of III law.

UNIT-IV

- 4.1 Noble gases – Electronic configurations – Reasons for placing in zero group – position in the periodic table – Chemical inertness of noble gases, reasons – Applications, Clathrates.
- 4.2 Di and tri-hydric phenols, alpha and beta naphthols, preparation, properties uses.
- 4.3 Partial molar properties – Chemical potential – Gibbs-Duhem equation effect of temperature and pressure on chemical potential – chemical potential in systems of ideal gases.

UNIT-V

- 5.1 Compounds of Xenon – hybridization and geometries of XeF_2 – XeF_4 - XeF_6 - XeOF_4 .
- 5.2 Ring substitution in phenol – nitration - Sulphonation – halogenation – coupling with diazonium salts.
- 5.3 Mechanisms of etherification chemical potential of solvent in Binary ideal liquid solutions – Duhem –Margules equation & Applications

REFERENCE:

- 1. Text book of Inorganic Chemistry by Puri&sharma.
- 2. Text book of Inorganic Chemistry by PL Sony.
- 3. Text book of Inorganic Chemistry by JD.Lee.
- 4. Text book of Organic Chemistry by PL Sony.
- 5. Text book of Organic Chemistry by Morison & Boyd.
- 6. Text book of Organic Chemistry by Bahl&Arunbahl.
- 7. Text book of Physical Chemistry by Puri& Sharma.
- 8. Text book of Physical Chemistry by PL Sony.
- 9. Thermo dynamics by Glasston&lewis.

**SEMESTER IV
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHPR41	PRACTICAL IV – QUALITATIVE ANALYSIS OF INORGANIC SALT MIXTURE	3	CC11	4

INORGANIC QUALITATIVE ANALYSIS

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.

RECORD	10 Marks
VIVA VOCE	15 Marks
ACID RADICALS	20 Marks
BASIC RADICALS	30 Marks
Total	<u>75 Marks</u>

REFERENCE BOOKS:

1. Basic Principles of Practical Chemistry.
V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu. S. Chand & Sons publications.

SEMESTER-IV
(ALLIED ZOOLOGY PAPER FOR CHEMISTRY)
(Common to both Allied Chemistry & Biochemistry students for code
U5CHAL41&U5BIAL42)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAL41	ALLIED ZOOLOGY II	6	CC12	7

Objective: *To understand task and principles of cell biology, Genetics, Developmental Biology, Physiology, Ecology and Evolution.*

UNIT 1

Cell biology – Structure of Eukaryotic and Prokaryotic cell- Genetics: Mendelian Principles, Law of segregation and Law of Independent assortment- Genetic code, DNA as the genetic material, Genetic Engineering and its applications.

UNIT 2

Structure of Ovum and Sperm and physico-chemical of fertilization - spermatogenesis, oogenesis, Cleavage and gastrulation of amphioxus and frog

UNIT 3

Human Physiology: Physiology of digestion, Human heart – structure and function- Kidney – Mechanism of urine formation, kidney transplantation

UNIT 4

Pollution - Air pollution and water, soil pollution and consequences. Atomic power plants – Safe guarding Mechanism. Green house effect – Global warming- Acid rain, ozone depletion.

UNIT 5

Evolution Theories – Lamarkism & Darwinism, Neo Lamarkism and Neo Darwinism.

Speciation-types, intra and inter specific.

Reference Books:

1. Cell Biology – De Robertis 1989
2. Cell Biology – S.C. Rastogi, TATA MC Graw Hill Publishing Company, 2006
3. A Manual of Zoology, Part – I & II 1990
4. Textbook of Vertebrate Embryology, NW. Majumdar 1993
5. Animal Ecology and Distribution of Animals, Veera Bala, Rastogi. 1983

SEMESTER-IV
(ALLIED ZOOLOGY PRACTICAL PAPER FOR CHEMISTRY)
 (Common to both Allied Chemistry & Biochemistry Students for code
 U5CHAP41&U5BIAP41)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAP41	ALLIED ZOOLOGY PRACTICAL II	1	AEC4	2

MODELS/SLIDES/SPOTTERS ONLY

CELL BIOLOGY:

1. MITOSIS
2. MEIOSIS
3. ANIMAL CELL, PROKARYOTIC CELL
4. SQUAMOUS EPITHELIUM
5. GLANDULAR EPITHELIUM

GENETICS:

1. DOMINANT AND RECESSIVE CHARACTERS- OBSERVATION IN HUMAN.

PHYSIOLOGY:(MODELS)

1. HUMAN HEART.
2. HUMAN KIDNEY.
3. HUMAN BRAIN.
4. OBSERVATION OF BLOOD PRESSURE –SPYGNOMONOMETER, STETHOSCOPE

EMBRYOLOGY:(SLIDES)

1. SPERM.
2. OVUM.
3. CHICK EMBRYO -24hours,48hours,72hours

ECOLOGY:

1. ANEMOMETER
2. BAROMETER
3. PH PAPER-WATER SAMPLE
4. ECOLOGICAL ADAPTATION

EVOLUTION:

EVOLUTION OF MAN.

FIELD VISIT:

ENVIRONMENTAL AWARENESS.

Reference Books:

1. Zoology practical manual.1&2 1983
2. Cellbiology- Verma and Agarval:Rastogi publications, New Delhi:2007
3. Genetics-Verma and Agarval,Chand publications,New Delhi:2006
4. Human physiology-chatterji,Rastogi publications:2006

SEMESTER IV
(ALLIED MATHEMATICS PAPER FOR CHEMISTRY)
(Common to both Physics and Chemistry students for code U5PYAL41 & U5CHAL42)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAL42	ALLIED MATHEMATICS – II	6	CC12	7

Objectives: *To Explore the Fundamental Concept of Mathematics.*

UNIT– I: INTEGRAL CALCULUS

Properties of definite integrals –Integration by parts – Reduction formulae –Simple Problems.

UNIT – II: PARTIAL DIFFERENTIAL EQUATIONS

Formation – Complete integrals and general integrals – Four standard types, Lagrange's equation.

UNIT –III: LAPLACE TRANSFORMS

Laplace Transformations of standard functions and simple properties – Inverse Laplace transforms – Applications of solutions of linear differential equations of order 1 and 2 – simple problems.

UNIT – IV: VECTOR ANALYSIS

Scalar point functions – Vector point functions – Gradient, divergence and curl – Directional derivatives –Line, Surface and Volume integrals – Gauss, Stoke's and Green's theorems (without proofs)– Simple problem based on these theorems.

UNIT – V : FINITE DIFFERENCES AND OPERATORS

First and Higher order differences – Forward and Backward difference – Properties of operators – Difference of a polynomial – Factorial polynomials – Operator E– Relation between Δ , ∇ and E.

RECOMMENDED TEXT:

ALLIED MATHEMATICS, *P. Duraipandian and S. Udayabaskaran*, (1997), Vol. I & II, Muhil Publishers, Chennai.

NUMERICAL ANALYSIS, *B.D. Gupta*, (2001), Konark Pub. Ltd., Delhi.

REFERENCES:

1. ANCILLARY MATHEMATICS, *P. Balasubramanian and K.G. Subramanian*, (1997), Vol. I & II, Tata McGraw Hill, New Delhi.
2. ALLIED MATHEMATICS, *S.P. Rajagopalan and R. Sattanathan*, (2005), Vol. I & II, Vikas Publications, New Delhi.
3. ALLIED MATHEMATICS, *P. Kandasamy and K. Thilagavathy*, (2003), Vol. I & II, S.Chand & Company, New Delhi.

SEMESTER IV
(ALLIED MATHEMATICS PRACTICAL PAPER FOR CHEMISTRY)
(Common to both physics and Chemistry students for code U5PYAP41 &U5CHAP42)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CHAP42	ALLIED PRACTICAL - COMPUTATIONAL MATHEMATICS II	1	AEC3	2

1. Finding area of two dimensional figures.
2. Finding volume of three dimensional figures.
3. Finding number of days between two given dates.
4. Calculation of continuous discounts.
5. Drawing graphs.

**SYLLABUS
For
M.Sc. CHEMISTRY**

**SEMESTERS – III & IV
(UNDER CBCS)**

2016-2017

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH1001	INORGANIC CHEMISTRY I	5	6

OBJECTIVES: *To make students acquainted with basics of crystallography, structure and bonding involved in Inorganic Chemistry and their basics.*

UNIT – I SOLID STATE **18 Hours**

Structure of solids – Comparison of X-ray and neutron diffraction, structure of Cadmium Iodide and Nickel arsenide, Pervoskite; spinels; defects in solids (Frenkel, Schottky types); Non-stoichiometric compounds. Electrical, magnetic and optical properties of solids- Band theory, semi-conductors, super conductors, Solid state lasers. Types of magnetic behaviour – dia, para, ferro, antiferro and ferrimagnetism; hysteresis, magnetic susceptibility and measurements – Guoy and Faraday methods;

UNIT – II STRUCTURE AND BONDING **18 Hours**

Polyacids: Isopolyacids and heteropolyacids of Vanadium, Chromium, Molybdenum and Tungsten – properties and structure. Inorganic polymers: General properties, Phosphorous based polymers – polyphosphazenes ; Sulphur based polymers – Sulphur Nitrides – synthesis, structure and applications. Silicates: Types, structure, properties and applications; Molecular sieves. Inorganic phosphors, Ferrites, Garnets.

UNIT – III METAL CLUSTERS & BORON HYDRIDES **18 Hours**

Metal clusters: Carbonyl clusters and halide clusters – upto tri-nuclear metal clusters, quadruple bond; naked clusters. Boron hydrides: Polyhedral boranes, carboranes, metallocarboranes – preparation, properties and structure.

UNIT – IV COORDINATION CHEMISTRY **18 Hours**

Stability of complexes – factors affecting the stability of complexes, thermodynamic aspects of complex formation, determination of stability constants – spectrophotometric, polarographic and potentiometric methods. SHAB approach – Pearson`s principle, applications in metallurgy.

UNIT – V STEREOCHEMISTRY OF COORDINATION COMPOUNDS **18 Hours**

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 – Optical rotatory dispersion (ORD) and Circular Dichroism (CD). Macrocyclic ligands – Crown ethers, Porphyrins, Corrins, Cryptands and Schiff`s bases.

Reference Book:

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, Pw. Atkins and C.H. Langford, Inorganic Chemistry, OUP (1990)

Recommended Books

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, Butter Worths (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.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH1002	ORGANIC CHEMISTRY I	5	6

OBJECTIVE : *To learn the concepts of stereochemistry, conformational analysis and their application in the determination of reaction mechanism. To understand the mechanism of nucleophilic and electrophilic substitution reactions.*

UNIT I – STEREOCHEMISTRY

18 Hours

Optical activity and chirality, Classification of chiral molecules as asymmetric and dissymmetric. A brief Study of dissymmetry of allenes, biphenyls, spiro compounds, trans cyclooctane 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.

Geometrical isomerism, E, Z - nomenclature of olefins, Geometrical and optical isomerism (if shown) of disubstituted cyclopropane, cyclobutane and cyclopentanes. Stereo specific and stereo selective reactions, Identification of enantiotopic, homotopic, diastereotopic hydrogens and Prochiral compounds in carbon compounds. Stereo specific & stereo selective synthesis.

UNIT II – CONFORMATIONAL ANALYSIS

18 Hours

Conformation of some simple 1, 2 – disubstituted ethane derivatives. Conformational analysis of disubstituted cyclohexane. Conformation of substituted cyclohexanol, cyclohexanone and cyclohexane carboxylic acid derivatives. Conformation and stereochemistry of cis and trans decalin and 9 – methyldecalin.

UNIT III – ALIPHATIC NUCLEOPHILIC SUBSTITUTION REACTION

18 Hours

S_N1, S_N2 and S_Ni mechanisms – Neighbouring group participation – reactivity, structural and solvent effects – substitution in norbornyl and bridgehead systems – substitution at allylic and vinylic carbons – substitution by ambident nucleophiles – 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, Claisen and Dieckmann condensation.

S_E1, S_E2 and S_Ei 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

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 – Hack, Gattermann, Gattermann – Koch, Kolbe reaction, Synthesis of di and tri substituted benzene (symmetrical tribromobenzene, 2-amino 5-methylphenol, 3 nitro 4-bromobenzoic acid, 3, 4-dibromonitrobenzene, 1,2,3 – trimethylbenzene) starting from benzene or any monosubstituted benzene. Electrophilic substitution of furan, pyrrole, thiophene and pyridine-N-oxide.

UNIT V – AROMATIC NUCLEOPHILIC SUBSTITUTIONS & DETERMINATION OF REACTION MECHANISM

18 Hours

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.

Kinetic and non-kinetic methods of determining organic reaction mechanism. Hammett and Taft equations – Simple Problems.

RECOMMENDED BOOKS

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.

Reference Books:

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, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai.
6. Stereochemistry of carbon compounds by Ernest Eliel
7. Stereochemistry and Mechanism through solved problems by P.S. Kalsi. Wiley Eastern Ltd., (1994)
8. Basic principles of Organic Stereochemistry by P. Ramesh – Madurai Kamaraj University.
9. Organic Reaction Mechanism by R.K. Bansal.
10. A Guide book to mechanism in organic chemistry by Longman.
11. Structure and mechanism in organic chemistry by C.K. Ingold, cornell University press.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH1003	PHYSICAL CHEMISTRY I	4	6

OBJECTIVE: *To study 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

18 Hours

Partial molar properties-Partial molar free energy (Chemical potential) - Partial molar volume and Partial molar heat content - Their significance and determination of these quantities. Variation of chemical potential with temperature and pressure.

Thermodynamics of real gases – gas mixture – definition of fugacity - determination of fugacity - variation of fugacity with temperature and pressure – thermodynamics of ideal and non ideal binary solutions – dilute solutions.

UNIT II –THERMODYNAMICS AND THEORIES OF CHEMICAL KINETICS

18 Hours

Excess functions for non ideal solutions and their determination – the concept of activity and activity coefficients – determination of standard free energies – choice of standard states - determination of activity and activity coefficients for non electrolytes.

Effect of temperature on reaction rates – collision theory of reaction rate – molecular beams – collision cross sections – effectiveness of collisions – probability factor – absolute reaction rate theory (ARRT) to simple unimolecular and bimolecular processes.

UNIT III –CHEMICAL KINETICS

18 Hours

Potential energy surfaces – kinetic isotopic effects - Reactions in solutions – effect of pressure, dielectric constant and ionic strength on reactions in solutions – kinetic isotope effects – linear free energy relationships – Hammett and Taft equations.

UNIT IV– ELEMENTS OF GROUP THEORY

18 Hours

Symmetry elements and symmetry operations – Groups – rules for forming a group, finite group, infinite group, abelian group, sub group- group multiplication table – sub groups, similarity transformation and classes – identifications of symmetry operations and determination of point groups – reducible and irreducible representations – direct product representation.

UNIT V – APPLICATIONS OF GROUP THEORY

18 Hours

Orthogonality theorem and its consequences – construction of character table for C_{2v} and C_{3v} – hybrid orbitals in non linear molecules (CH_4 , XeF_4 , BF_3 , SF_6 and NH_3). Determination of representations of vibrational modes in non linear molecules (H_2O , CH_4 , BF_3 , and NH_3). Symmetry selection rules of infra-red and Raman spectra – application of group theory for the electronic spectra of ethylene and formaldehyde .

TEXT BOOKS

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, Prentice-Hall, 2000.
4. Thomas Engel and Philip 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, Harper And Row, New York, 1987.
7. K.L.Kapoor, A text 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.

SUGGESTED REFERENCE BOOKS

1. W.J.Moore Chemistry, Orient Longman, London. 1972.
2. K.G.Denbigh, Thermodynamics Of Steady State, Methuen And Co.Ltd, London, 1951.
3. L.K. Nash, Elements Of Chemical Thermodynamics, Addison Wesley, 1962.
4. G.M.Barrow, Physical Chemistry, Mcgraw Hill, 1988.
5. R.G.Frost and Pearson, Kinetics And Mechanism, Wiley, New York, 1961.
6. C.Capellos and B.H.J.Bielski, Kinetics Systems, Wiley 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 Sons Inc., New York, 1971.
10. N.Thinkham, Group Theory and Quantum Mechanics, Mc Graw 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.

**I SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHPR11	PRACTICAL I-ORGANIC PRACTICAL I	4	6

Objective: *To learn the preparation techniques and Extraction methods*

1. 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 from p-toluidine
 - (viii) 2,3 – Dimethylindole from phenyl hydrazine and 2 – butanone
 - (ix) Methyl orange from sulphanilic acid
 - (x) Diphenyl methane from benzyl chloride

2. Extraction.
 - (i) Caffeine from Tea Dust,
 - (ii) Lactic Acid from Milk
 - (iii) Citric Acid from Lemon
 - (iv) Jasmine from Rose

Total	75Marks
Preparation	25 Marks
Recrystallisation	10 Marks
Extraction	20 Marks
Practical Viva	10 Marks
Record	10 Marks

REFERENCE:

1. Practical Organic Chemistry by Vogel.

RECOMMENDED BOOKS

1. Practical Organic Chemistry by Gnanaprakasam.

**I SEMESTER
(CORE BASED ELECTIVE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHEP11	PRACTICAL II- COLORIMETRY	4	6

Objective: To learn preparation and estimation techniques

1) 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)

2) Colourimetric analysis of Iron, Nickel, Manganese and Copper

Total: 75 Marks

1. a) Preparation	25 Marks
b) Recrystallisation	5 Marks
2. Estimation	25 Marks
3. Viva-Voce	10 Marks
4. Record	10 Marks

RECOMMENDED BOOK:

1. Qualitative Inorganic Analysis by V.V. Ramanujam

REFERENCE BOOK:

1. Practical Inorganic Chemistry by Vogel.

I SEMESTER
(CORE BASED ELECTIVE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHEP12	PRACTICAL III- KINETIC STUDIES	4	6

OBJECTIVE: *To Study the experiments in chemical equilibrium and chemical kinetics.*

1. Determine the relative acidity ratio for the hydrolysis of ester in presence of two different acids.
2. Determine the temperature coefficient and activation energy of hydrolysis of ethyl acetate.
3. Study the inversion of cane sugar in the presence of acid using Polarimeter.
4. Study the simultaneous distribution of benzoic acid in benzene – water system.
5. Study the absorption of acetic acid by charcoal (Fruendlich isotherm)

Total 75 Marks

- | | |
|--------------|----------|
| 1. Practical | 55 Marks |
| 2. Viva-Voce | 10 Marks |
| 3. Record | 10 Marks |

Recommended Books:

1. Physical Practical Experiments by Palit.
2. Advance Practical Chemistry by R. Mukhopadhyay & P. Chatterj

Reference Books;

1. Pratical Physical Chemistry by Findler Findler.
2. Practical Physical Chemistry by B. Viswanathan & P.S. Raghavan.

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH2001	INORGANIC CHEMISTR - II	5	5

OBJECTIVES: *To make the students acquaint themselves with Nuclear Chemistry Know-how, Stellar and cosmic phenomenon and also about coordination and bonding in transition metals and other compounds*

UNIT I: THEORIES OF COORDINATION CHEMISTRY 18 Hours

Crystal field theory (CFT) – d orbital splitting in octahedral, tetrahedral and square planar complexes, Ligand field stabilization energy (LFSE), Spectrochemical series, Spectral and magnetic characteristics of transition metal complexes, Jahn – Teller distortion, Limitations of CFT.

UNIT II: COORDINATION CHEMISTRY M.O. THEORY 18 Hours

Molecular orbital theory – evidence for metal- ligand orbital overlap, energy level diagrams; Nephelauxetic effect. Term states of d ions – term symbols, spin orbit coupling (LS coupling or RS coupling), d-d transition, selection rules for transition, Orgel and Tanabe-Sugano diagrams. Charge transfer spectra – features and comparison with d-d spectra.

UNIT III: COORDINATION CHEMISTRY REACTION MECHANISM 18 Hours

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. 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, applications and theory of trans effect.

UNIT IV: NUCLEAR CHEMISTRY – I 18 Hours

Nuclear properties – Nuclear spin and moments, origin of nuclear forces, salient features of the liquid drop and shell models of the nucleus. Models of radioactive decay: Orbital electron capture; nuclear isomerism, internal conversion, detection and determination of activity by cloud chamber, nuclear emulsion, bubble chamber, G.M, counter Scintillation and Cherenkov counters. Compound nucleus theory, high energy nuclear reactions, nuclear fission and fusion reactions as energy sources: direct reactions: photonuclear and thermo nuclear reactions.

UNIT V: NUCLEAR CHEMISTRY – II

18 Hours

Nuclear Reaction types, reactions, cross section, Q-value, threshold energy, Stellar energy: synthesis of elements, hydrogen burning, carbon burning. The e, s, r, p and x processes. Nuclear reactors: fast breeder reactors, particle accelerators, cyclotron and synchrotron. Radio analytical methods: Isotope dilution analysis, radiometric titrations, radio immuno assay, neutron activation analysis.

REFERENCE BOOKS:

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, Pw. 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)

RECOMMEND BOOKS:

1. K. Burger, Coordination Chemistry, Butterworths (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. Arnikar, 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.

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH2002	ORGANIC CHEMISTRY – II	5	6

OBJECTIVE: *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

Electrophilic, nucleophilic and neighbouring group participation mechanisms – addition of halogen and nitrosyl chloride to olefins. Hydration of olefins and acetylenes. Hydroboration, hydroxylations, Michael addition, 1, 3 – dipolar additions, Carbenes and their additions to double bonds – Simmon and Simmon Smith reaction. Mannich, Stobbe, Darzen, Wittig, Wittig – Horner and Benzoin reactions. Stereochemical aspects to be studied wherever applicable.

UNIT II – ELIMINATION REACTIONS 18 Hours

E₁, E₂ and E₁CB mechanism – E₁, E₂ and E₁CB spectrum – Orientation of the double bond – Hoffman and Saytzeff rules – Competition between elimination and substitution. Typical eliminations reactions – dehydration, dehydrohalogenation and dehalogenation. Stereochemistry of E₂ eliminations in cyclohexane systems. Mechanism of pyrolytic eliminations. Chugaev and Cope eliminations.

UNIT III – MOLECULAR REARRANGEMENTS 18 Hours

A detailed study with suitable examples of the mechanism of the following rearrangements: Pinacol – Pinacolone (examples other than tetramethylethylene glycol) – Wagner – Meerwein, Demjanov, dienone – phenol, Favorski, Baeyer – Villiger, Wolf, Stevens (in cyclic systems) and Von Richter rearrangements.

UNIT IV – OXIDATION 18 Hours

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.

Formation of C=C, C-C bonds by dehydrogenation, dehydrogenation by quinones, SeO₂, Hg(OAc)₂ and Pb(OAc)₄, 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-oxidative cleavage of C-C bond.

UNIT V – REDUCTION, CARBENES AND NITRENES

18 Hours

Reduction : Selectivity in reduction 4-t-butylcyclohexanone using selected hydride reducing agents – Synthetic importance of Clemmenson and Wolf-Kishner reductions – Modification of Wolff-Kishner reduction – Birch reduction, MPV reduction. Catalytic hydrogenation, Sommelet reaction and selection in reduction . Clemmensen reduction. Reduction with LiAlH_4 , NaBH_4 , tritertiarybutoxyaluminium hydride, sodium Cyanoborohydride, trialkyltin hydride, hydrazines.

Carbenes and nitrenes : Methods of generation , structure, addition reactions with alkenes –insertion reactions.

RECOMMENDED BOOKS

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.

REFERENCE BOOKS

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.,

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CH2003	PHYSICS CHEMISTRY II	4	6

OBJECTIVE: *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

18 Hours

Interaction of matter with radiation – Einstein's theory of transition probability – rotational spectroscopy of a rigid rotator – non rigid rotator – diatomic and polyatomic molecules. Vibrational spectroscopy – harmonic oscillator - anharmonicity – vibrational spectra of poly atomic molecules – vibrational frequencies – group frequencies – vibrational coupling overtones – Fermi resonance. Raman Spectra- elastic and inelastic scattering – pure rotational raman spectra – mutual exclusion principle.

UNIT II – SURFACE PHENOMENON

18 Hours

Adsorption and free energy reaction at interfaces – physisorption and chemisorptions – study of surfaces adsorption isotherms - Langmuir and BET adsorption isotherms-surface area determinations – Heat of adsorption , determination of adsorption from solutions – Gibbs adsorption isotherm- study of kinetics of surface reactions-catalysis by metals, semiconductor oxides-mechanism of heterogeneous catalytic reactions-the adsorption coefficient and its significance.

UNIT III – CHEMICAL KINETICS

18 Hours

Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions-chain length-Rice Herzfeld mechanism-explosion limits.

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

Inadequacy of classical theory – Bohr's quantum theory and subsequent developments - the Compton effect-wave particle duality-uncertainty principle – waves equation for electrons-quantum mechanical postulates-the operators – Hermitian property

Schrodinger equation-elementary application of Schrodinger's equation-the particle in a box (one,two and three dimensional cases),

UNIT V – APPLICATIONS OF QUANTUM CHEMISTRY

18 Hours

The harmonic oscillator-the rigid rotor-particle in a ring, Schrodinger equation for hydrogen atom (no derivation is required) and the solution - the origin of quantum numbers (angular momentum and spin) - their physical significance.

TEXT BOOKS:

1. C.N.Banwell and E.M.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.

SUGGESTED REFERENCE BOOKS

1. Raymond Chang,Basic Priciples Of Spectroscopy,Mcgraw Hill Ltd.,New York,1971.
2. P.W.Atkins,Advanced Physical Chemistry,Oxford Press,1990.
3. G.Arul Doss,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,Addision 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.

**II SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHPR21	PRACTICAL IV PHYSICAL PRACTICAL I	4	6

Aim: To study the experiments in chemical equilibrium and molecular weight determination of substances using thermometry and viscometry.

1. Construct the phase diagram for a simple binary system naphthalene – phenanthrene and benzophenone-diphenyl amine.
2. Study the kinetics of persulphate oxidation.
3. Determine the equilibrium constant of the reaction between iodine and potassium iodide by partition method and determine the concentration of the given unknown KI solution
4. Study the kinetics of Iodination of Acetone
5. Determination of molecular weight of the substance by Rast method.

<u>Total</u>	<u>75 Marks</u>
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- | | |
|--------------|----------|
| 1. Practical | 55 Marks |
| 2. Viva-Voce | 10 Marks |
| 3. Record | 10 Marks |

Recommended Books:

1. Physical Practical Experiments by Palit

Reference Books;

1. Practical Physical Chemistry by Findler Findler

II SEMESTER
(CORE BASED ELECTIVE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHEP21	PRACTICAL V ORGANIC MIXTURE ANALYSIS	4	6

Identification of components in a two component mixture and preparation of their derivatives.

Determination of b.p. / m.p. for components and m.p. for the derivatives.

<u>Total</u>	<u>75Marks</u>
Pilot Separation	15 Marks
Component 1	20 Marks
Component 2	20 Marks
Practical Viva	10 Marks
Record	10 Marks

REFERENCE:

1. Practical Organic Chemistry by Vogel.

RECOMMENDED BOOKS

1. Practical Organic Chemistry by Gnanaprakasam.

**II SEMESTER
(CORE BASED ELECTIVE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CHEP22	PRACTICAL VI INORGANIC SEMI-MICRO QUALITATIVE ANALYSIS	4	6

Objective: *To learn how to separate inorganic radicals & identify them.*

1. Semimicro qualitative analysis of mixture containing two common and two rare cations.
2. The following are the rare cations to be included. W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo.
3. Estimation of hardness of water using EDTA.

<u>Total</u>	<u>75 Marks</u>
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(a) Acid Radicals	20 Marks
(b) Basic Radicals	20 Marks
(c) Water Analysis	15 Marks
(d) Viva Voce	10 Marks
(e) Record	10 Marks

RECOMMENDED BOOK:

1. Qualitative Inorganic Analysis by V.V. Ramanujam

REFERENCE BOOK:

1. Practical Inorganic Chemistry by Vogel.

SYLLABUS
For
B.Sc. BIOCHEMISTRY

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BI3001	ANALYTICAL BIOCHEMISTRY	7	CC07	7

OBJECTIVES:

- ✓ To understand the principles and biological applications of various biochemical techniques.

UNIT- I:UNITS OF MEASUREMENT

20hrs

Units of measurements of solutes in solution (Normality, Molality, Molarity, Ionic strength, Milli moles).Osmosis and its biological importance, Osmotic pressure, Osmolarity and its applications.Concept of isotonic, hyper and hypotonic solution and its importance in biology.Concept of pH, pOH, biological importance of pH, pH value of bodily fluids, buffer, buffer capacity, Henderson – Hassel Balch equation and its importance Buffers in body fluid- Bicarbonate, Phosphate and protein buffer.

Dialysis and its biomedical importance, Gibbs-Donnan membrane equilibrium.Surface tension, viscosity, colloids and their biomedical importance.

UNIT- II: MEASUREMENT OF pH

10hrs

EMF, Nernst equation, reference electrode.Principle of electrochemical techniques.Principle, instrumentation and applications of hydrogen electrode, glass electrode in determination of pH.Principle, instrumentation and applications of Clark oxygen electrode.Quinn hydrone electrode.pH meter.

UNIT- III: CENTRIFUGATION

20hrs

Basic principle of centrifugation techniques, sedimentation rate, Svedberg unit/sedimentation coefficient. Preparative ultracentrifuge, Differential centrifugation, density gradient centrifugation, rate zonal, isopycnic, equilibrium isodensity centrifugation. Analytical ultracentrifuge - determination of molecular weight (derivation not included).

UNIT- IV: CHROMATOGRAPHY

20hrs

General principles of chromatography, classification, Principle, operation procedure and applications of- paper chromatography, thin layer chromatography, ion exchange chromatography, molecular sieve chromatography, affinity chromatography, gas liquid chromatography and HPLC.

UNIT- V: ELECTROPHORESIS

20hrs

General principles. Factor affecting electrophoretic mobility – sample, electric field, supporting medium, buffer. Tiselius moving boundary, cellulose acetate electrophoresis. Native PAGE, SDS-PAGE, agarose gel electrophoresis and immuno electrophoresis.

BOOKS FOR STUDY:

1. Biophysical Chemistry – Upadhyay and UpadhyayNath, Himalayan 2009 revised edition.
2. Introduction to Practical Biochemistry – Shawney, Randhir, Singh, Narosa.

BOOKS FOR REFERENCE

1. Practical Biochemistry- Principles and Techniques, Keith Wilson and John Walker, Cambridge Press 4th Edition.
2. Practical Biochemistry by K. Wilson and I. Walker. 7th edition, Cambridge University press (2010)
3. Introduction to Instrumental Analysis by Robert D. Braun, Pharma Book Syndicate (2006)
4. Analytical Biochemistry – R.B. Turner, Elsevier, N.Y.
5. Biomedical Instrumentation – M. Arumugam, Anuradha Agencies, Chennai.
6. Instrumental Methods of Analysis – Chatwal and Anand, Himalayan Publication.

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BIPR31	PRACTICAL III- VOLUMETRIC ANALYSIS AND BIOLOGICAL PREPARATION	1	CC08	2

OBJECTIVES:

- ✓ *To have knowledge about titrimetric analysis.*
- ✓ *To know about the isolation of macromolecules from natural source.*

VOLUMETRIC ANALYSIS

1. Estimation of iron,
2. Estimation of oxalate.
3. Estimation of copper.
4. Estimation of nitrite.
5. Estimation of chloride by Mohr's method
6. Estimation of chloride Volhard's method.
7. Estimation of calcium by oxalate method.

BIOCHEMICAL PREPARATIONS

1. Preparation of starch from potatoes.
2. Preparation of casein from milk.
3. Preparation of lactalbumin from milk.
4. Preparation of albumin from egg.
5. Preparation of lecithin from egg yolk.

BOOKS FOR STUDY:

1. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
2. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.

BOOKS FOR REFERENCE

1. A Biologist guide to principles and techniques of practical biochemistry. Bryan, W. & Keith, W.
2. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
3. Experimental procedures in Life Sciences by Dr.S.Rajan& Mrs. R. Selvi Christy. Anjaana Book House.
4. Text book of Clinical chemistry –Teitz.
5. Medical Laboratory Science, Theory and Practice J. Ochei& A. Kolhatkar, Tata McGraw - Hill.

SEMESTER III
(ALLIED ZOOLOGY PAPER FOR BIOCHEMISTRY)
(Common to both Allied Chemistry and Biochemistry students for Code U5BIAL31 & U5CHAL31)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BIAL31	ALLIED ZOOLOGY I	1	CC09	2

Objective: *To study the systematic and functional morphology of invertebrates and chordates.*

UNIT 1

Protozoa -Structure and Life cycle of Plasmodium, Porifera– Canal system in Sponges and Economic importance, Coelenterata – Obelia structure-Colony , medusa-Polymorphism in obelia, Platyhelminthes-Taenia solium- structure, life cycle and Pathogenic effects.

UNIT 2

General characters, Structure and economical importance- Annelida-Earthworm, Mollusca-Fresh water mussel, Echinodermata-sea star.

UNIT 3

General characters and phylogenic significance- Affinities of prochordates and vertebrates, Morphology of Amphioxus , Balanoglossus

UNIT 4

Structure and system – Digestive, Nervous and Reproduction system of Shark& Frog.

UNIT 5

Structure and systemic study – Digestive, nervous, Respiratory and Reproductive system of Calotes, Pigeon and Rat.

Reference Books:

1. Invertebrate Zoology – Verma and Agarwal – S. Chand Publishers -2001
2. Chordate Zoology- Verma and Agarwal – S. Chand Publishers -2007
3. Invertebrate Zoology – Saras Publication 2010
4. Chordate Zoology – Saras Publication 2012
5. Comparative Chordate Zoology – Water man- 1970
6. Invertebrate Zoology – Nigam -1980
7. Chordate Zoology – Nigam- 1980

SEMESTER III
(ALLIED ZOOLOGY PRACTICAL PAPER FOR BIOCHEMISTRY)
(Common to both Allied Chemistry and Biochemistry students for Code U5BIAP31 & U5CHAP31)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/WEEK
U5BIAP31	ALLIED ZOOLOGY PRACTICAL I	1	AEC3	2

MODELS/SLIDES/SPOTTERS ONLY

Dissection Model:

Cockroach: Digestive, Nervous and Reproductive system.
Frog : Digestive, Nervous and Urinogenital sytem

Minor Practical (Mounting Spotters):

1. Body setae of Earthworm.
2. Mouth parts of Mosquito.
3. Mouth parts of Honey Bee.

SPOTTERS:

4. Invertebrata

PROTOZOA - Euglena & Entamoeba histolytica, Plasmodium
PORIFERA - Sycon
COELENTERATA - Obelia
PLATYHELMINTHES -Taenia Solium
ASCHELMINTHES -Ascaris – Male and Female
NEMATODA -Earth Worm
MOLLUSCA -Pila, Fresh Water Mussel
ARTHROPODA -Prawn
ECHINODERMATA -Sea Star

5. Chordata

PROCHORDATA -Balanoglossus, Amphioxus
PISCES -Shark, Electric ray fish, Hammer headed fish
AMPHIBIA -Frog
REPTILIA -Calotes Snakes-Cobra, Python
AVES -Pigeon- Pigeon Quill Feather
MAMALLIA -Rat.

Reference Books:

Practical Manual – Lab. Rastogi – Meerut 1980
Practical Zoology – N. Armugam 198

**SEMESTER IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BI4001	ANALYTICAL BIOCHEMISTRY & BIOINFORMATICS	7	AEC3	7

OBJECTIVES:

To understand the principles and biological applications of various biochemical techniques.

UNIT- I: ABSORPTION SPECTRUM

20hrs

Basic properties of electromagnetic radiation, energy, wave length, wave number, frequency. Absorption and emission spectra. Beer lambert's law. Light absorption and its transmittance. Molar extinction coefficient. Principle, instrumentation, application of UV- visible spectroscopy- enzyme assay and kinetic studies. Protein and nucleic acid structural studies.

UNIT- II: EMISSION SPECTRUM

20hrs

Spectrofluorimetry techniques- principle, instrumentation and applications (vitamin assay riboflavin, thiamine), enzyme assays, fluorescent probes in the study of proteins and membranes. Atomic absorption spectroscopy- Principle, instrumentation and application. Flame photometry- principle, instrumentation and applications (analysis of trace elements- sodium and potassium).

UNIT-III: RADIO ISOTOPIC TECHNIQUES

20hrs

Atomic structure, radiation, type of radioactive decay, half-life, units of radioactivity. Detection and measurement of radioactivity – Methods based on ionization (GM Counter), excitation (Scintillation counter). Autoradiography. Applications of radioisotopes in the elucidation of metabolic pathways, clinical scanning, radio dating, and RIA. Applications of isotope dilution technique.

Biological hazards of radiation and safety measures in handling radio isotopes.

UNIT – IV:COMPUTER FUNDAMENTALS

15hrs

Computer – fundamentals, role of computers in biology.The internet - World Wide Web.E-resources - Useful search engines, software downloading,installation/uninstallation of computer software, computer operating systems.

UNIT – V:BIOINFORMATICS

15hrs

Introduction to bioinformatics, scope of bioinformatics,NCBI,Sequence data bases(Nucleic acids and proteins) - GENBANK, SWISS PROT.Finding scientific articles - PubMed.Application of bioinformatics in various fields.

BOOKS FOR STUDY:

1. Biophysical Chemistry - Upadhyay and UpadhyayNath, Himalayan 2009 revised edition.
2. Introduction to Practical Biochemistry - Shawney, Randhir, Singh, Narosa.

BOOKS FOR REFERENCE

1. Practical Biochemistry- Principles and Techniques, Keith Wilson and John Walker, Cambridge Press 4th Edition.
2. Practical Biochemistry by K. Wilson and I. Walker. 7th edition, Cambridge University press (2010)
3. Instrumental Methods of Analysis – Chatwal and Himalayan Publication.
4. Physical Biochemistry- David Friefelder.
5. Internet & World Wide Web, third edition, Dietel, Dietel, Gold Berg.
6. Multimedia, System design, Prabhat k. Andleigh, KiranThakrar.
7. Lesk, A.M. Introduction to Bioinformatics Oxford 2002.
8. Bergeron BP 2002 Bioinformatics Computing 1st Edition, Printice Hall
9. Bioinformatics: sequence and genome analysis, by David Mount, second edition.
Cold spring harbor lab press (2004)

**SEMESTER III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BIPR41	PRACTICAL IV- COLORIMETRIC TECHNIQUES & PREPARATION OF BUFFERS	1	CC11	2

OBJECTIVES:

- ✓ To understand about the principles, theory and calculation of colorimetric experiment.
- ✓ To have a knowledge of buffer preparations.

COLORIMETRIC ESTIMATION

1. Estimation of potassium dichromate.
2. Estimation of Carbohydrate by Anthrone method
3. Estimation of Protein by Biuret method.
4. Estimation of Protein by Bradford method
5. Estimation of Amino acid by ninhydrin method.
6. Estimation of DNA by diphenyl amine method
7. Estimation of RNA by orcinol method
8. Estimation of inorganic phosphorus by Fiske and Subbarow method.

PREPARATION OF BUFFERS

1. Preparation of Phosphate Buffer and determination of PH.
2. Preparation of Tris Buffer and determination of PH.
3. Preparation of Citrate Buffer and determination of PH.

BOOKS FOR STUDY:

1. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
2. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
3. Biochemical methods by S. Sadasivam

BOOKS FOR REFERENCE

1. A Biologist guide to principles and techniques of practical biochemistry. Bryan, W. & Keith, W.
2. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
3. Experimental procedures in Life Sciences by Dr. S. Rajan& Mrs. R. Selvi Christy.
4. Text book of Clinical chemistry –Teitz.
Medical Laboratory Science, Theory and Practice J. Ochei&

SEMESTER IV
(ALLIED ZOOLOGY PAPER FOR BIOCHEMISTRY)
(Common to both Allied Chemistry and Biochemistry students for Code U5CHAL41&U5BIAL41)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BIAL41	ALLIED ZOOLOGY II	1	AEC3	2

Objective: *To understand task and principles of cell biology, Genetics, Developmental Biology, Physiology, Ecology and Evolution.*

UNIT 1

Cell biology – Structure of Eukaryotic and Prokaryotic cell- Genetics: Mendelian Principles, Law of segregation and Law of Independent assortment- Genetic code, DNA as the genetic material, Genetic Engineering and its applications.

UNIT 2

Structure of Ovum and Sperm and physico-chemical of fertilization - spermatogenesis, oogenesis, Cleavage and gastrulation of amphioxus and frog

UNIT 3

Human Physiology: Physiology of digestion, Human heart – structure and function- Kidney – Mechanism of urine formation, kidney transplantation

UNIT 4

Pollution - Air pollution and water, soil pollution and consequences. Atomic power plants – Safe guarding Mechanism. Green house effect – Global warming- Acid rain, ozone depletion.

UNIT 5

Evolution Theories – Lamarkism & Darwinism, Neo Lamarkism and Neo Darwinism.

Speciation-types, intra and inter specific.

Reference Books:

1. Cell Biology – De Robertis 1989
2. Cell Biology – S.C. Rastogi, TATA MC Graw Hill Publishing Company, 2006
3. A Manual of Zoology, Part – I & II 1990
4. Textbook of Vertebrate Embryology, NW. Majumdar 1993
5. Animal Ecology and Distribution of Animals, Veera Bala, Rastogi. 1983

SEMESTER IV
(ALLIED ZOOLOGY PRACTICAL PAPER FOR BIOCHEMISTRY)
(Common to both Chemistry and Biochemistry students for
Code U5CHAP41&U5BIAP41)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BIAP41	ALLIED ZOOLOGY PRACTICAL II	1	AEC3	2

MODELS/SLIDES/SPOTTERS ONLY

Dissection Model:

Cockroach: Digestive, Nervous and Reproductive system.

Frog : Digestive, Nervous and Urinogenital sytem

Minor Practical (Mounting Spotters):

1. Body setae of Earthworm.
2. Mouth parts of Mosquito.
3. Mouth parts of Honey Bee.

SPOTTERS:

4. Invertebrata

PROTOZOA - Euglena & Entamoeba histolytica, Plasmodium
PORIFERA - Sycon
COELENTERATA - Obelia
PLATYHELMINTHES -Taenia Solium
ASCHELMINTHES -Ascaris – Male and Female
NEMATODA -Earth Worm
MOLLUSCA -Pila, Fresh Water Mussel
ARTHROPODA -Prawn
ECHINODERMATA -Sea Star

5. Chordata

PROCHORDATA -Balanoglossus, Amphioxus
PISCES -Shark, Electric ray fish, Hammer headed fish
AMPHIBIA -Frog
REPTILIA -Calotes Snakes-Cobra, Python
AVES -Pigeon- Pigeon Quill Feather
MAMALLIA -Rat.

Reference Books:

Practical Manual – Lab. Rastogi – Meerut 1980
Practical Zoology – N. Armugam 198

SYLLABUS
For
M.Sc. BIOCHEMISTRY

SEMESTERS – I & II

(UNDER CBCS)

2016-2017

**SEMESTER – I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BI1001	BIOMOLECULES	5	6

Objectives:

The objective is to impart knowledge on the structure and functions of biomolecules.

Unit I - PROTEINS

20 Hrs

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. Pauling and Corey model for fibrous proteins. Collagen triple helix. Super secondary 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 AND GLYCOCONJUGATES 15 Hrs

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 Hrs

DNA double helical structure- Watson and Crick model. A, B and Z forms of DNA. Unusual structures – palindrome, inverted repeats, cruciform and hairpins. Triple and quadruple structures. 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. HTH, HLH, zinc finger motif, leucine zipper motif.

Unit IV– LIPIDS

15 Hrs

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 biomembranes.

Unit V– VITAMINS & MINERALS

20 Hrs

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.

Books for Reference

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.
4. Biochemistry Stryer 6th edition Freeman, 2006.
5. Books for study of Biochemistry by R.C. Dubey

**SEMESTER – I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BI1002	ENZYMES	5	6

Objectives

To understand the structure, properties, biological significance and actions of enzymes.

Unit I - INTRODUCTION & CLASSIFICATION 20Hrs

History, classification and nomenclature, methods of isolation and purification. Enzyme Units- Katal, specific activity, turnover number. Intracellular localization of enzymes. Active site - investigation of active site structure. A brief account of non-protein enzymes- ribozymes and DNA enzyme. Enzyme Specificity- Lock & Key and Induced Fit hypothesis.

Unit II- ENZYME KINETICS 20 Hrs

Kinetics of single substrate enzyme catalyzed reactions. - MichaelisMenten equation- significance, Derivation and significance K_m . Lineweaver-burke plot, Eadie-Hofstee plot & Hanes plot. Pre-steady state kinetics. Kinetics of multi-substrate enzyme catalyzed reaction –ping-pong bi-bi, random order and compulsory order mechanism.

Unit III - ENZYME CATALYSIS AND INHIBITION 20 Hrs

Mechanism of catalysis-general acid-base, electrostatic and covalent catalysis. Mechanism of enzyme catalysis without cofactors- chymotrypsin, ribonuclease and lysozyme. Enzyme inhibition- reversible inhibition-Competitive, uncompetitive, noncompetitive and allosteric inhibition. Irreversible inhibition. Applications of inhibitors.

Unit IV - COENZYMES & ISOENZYMES 15 Hrs

Structure and functions of- nicotiamide nucleotides (NAD^+ , $NADP^+$), flavin nucleotides (FMN, FAD), adenosine triphosphate, Coenzyme A, thiamine pyrophosphate, pyridoxyl phosphate, tetrahydrofolate and biotin.

Unit V - ENZYMES IN INDUSTRIES

15 Hrs

Industrial uses of enzymes – detergent, textile, leather and food industries (amylase, cellulase, protease, lipase, peroxidase, invertase, pectinase, catalase, rennin. Immobilization of enzymes and their applications.

Books for study

1. Understanding enzymes by Palmer, Prentice Hall, 4 sub edition (1995)
2. Harper's Biochemistry, Murray, Granner, Mayes, Rodwell 25th Edition. McGrawhill Co.

Books for Reference

1. Biochemistry by Metzler. Academic press (2000)
2. Biochemistry by Stryer. W.H. Freeman 6th edition (2006)
3. Enzymes by Boyer. Academic press 3rd edition (Nov 1983)
4. Enzymes by Dixon and Webb, Academic Press (1964)

**SEMESTER – I
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIPR11	PRACTICAL –I ISOLATION AND ESTIMATION OF BIOMOLECULES	4	6

Objectives:

To introduce the principles and protocols of spectrophotometric analysis. Calculate quantities and concentration of biomolecules from standard curve

1. Isolation of DNA from Goat spleen, plant sources (Onion), Microbial genomic DNA.
2. Estimation of DNA
3. Isolation of RNA from Yeast
4. Estimation of RNA
5. Isolation of Glycogen from liver
6. Estimation of glycogen.
7. Estimation of Pyruvate.
8. Estimation of Lactate.
9. Estimation of Tryptophan.
10. Estimation of Protein by Lowry's method.
11. Estimation of Protein by Bradford method.
12. Estimation of Inorganic Phosphorus by Fiske and SubbaRao method.
13. Estimation of Total lipids

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 Reference

1. Laboratory manual in Biochemistry – Jayaraman
2. Biochemical methods – S.Sadasivan and Manickam

SEMESTER – I
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIPR12	PRACTICAL – II ENZYME ASSAYS	4	6

Objectives:

To make the students understand the basic steps involved in extraction and determination of enzyme activities. Calculate enzymatic activities from experimental data.

1. Isolation of Alkaline Phosphatase from Kidney
2. Determination of Optimum pH on Alkaline phosphatase
3. Determination of Optimum Temperature on Alkaline phosphatase
4. Effect of Substrate Concentration on Alkaline Phosphatase Activity
5. Isolation of Acid Phosphatase from Potato
6. Determination of Optimum pH on Acid phosphatase
7. Determination of Optimum Temperature on Acid phosphatase
8. Inhibition of Acid Phosphatase Activity by EDTA
9. Isolation of Urease from jack bean.
10. Effect of Optimum pH on urease.
11. Effect of Optimum temperature on urease.
12. Effect of substrate concentration on urease.

Books for study

1. Laboratory manual in Biochemistry – Jayaraman
2. Biochemical methods – S. Sadasivan and Manickam

Books for Reference

1. Medical Laboratory technology – kanai L. Mukherjee, Tata McGraw Hill Publication and Co. ltd., vol. I, II, III.
2. Practical clinical biochemistry – Harold Varley, CBS, New Delhi.

SEMESTER – I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIE101	CELL BIOLOGY	4	6

Objective: *To understand the structure, functions and dynamics of cells.*

Unit I- MEMBRANE STRUCTURE AND FUNCTION 20 hrs

Structure of model membrane, lipid bilayer and membrane protein diffusion, osmosis, ion channels, active transport, membrane pumps, mechanism of sorting and regulation of intracellular transport, electrical properties of membranes.

Unit II- STRUCTURAL ORGANIZATION AND FUNCTION 20 hrs

Structural organization and function of intracellular organelles (Cell wall, nucleus, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, chloroplast, structure & function of cytoskeleton and its role in motility).

Unit III- ORGANIZATION OF GENES AND CHROMOSOMES 20 hrs

Organization of genes and chromosomes- Operon, unique and repetitive DNA, interrupted genes, gene families, structure of chromatin and chromosomes, heterochromatin, euchromatin, transposons.

Unit IV - CELL CYCLE AND CELL DEATH 15 hrs

Eukaryotic cell cycle and its regulation. Phases of cell cycle. Mitosis and its regulation and control mechanisms. Meiosis and its regulation and control mechanisms. Cell death – necrosis and apoptosis.

Unit V- STEM CELL BIOLOGY

Stem cell biology – concept, methods, isolation, identification, expansion, differentiation and applications. Stem cell engineering - applications in medicine - tissue engineering and transplantation. Stem cell therapy.

Books for study

1. Stansfield et al. Molecular Cell Biology. Schaum's Series. McGraw Hill, 1996.
2. Nelson Cox. Lehninger's Principles of Biochemistry. Freeman Worth Publ. 4th ed. 2005.

Books for Reference

1. e Robertis and De Robertis. Cell and Molecular Biology. Lea and Febiger. 8th ed.
2. Lodish et al. Molecular Cell Biology. Scientific 5th ed. Freeman.
3. Karp G. Cell and Molecular Biology. 3rd ed. John Wiley and Sons. 2002.
4. Wilson and Walker. Practical Biochemistry. Cambridge University Press. 2000

SEMESTER – I
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIE102	ANIMAL CELL SCIENCE AND TECHNOLOGY	4	6

Objectives:

To understand the basics of animal cell culture and maintenance

Unit I- ANIMAL CELL CULTURE **20 hrs**

Animal cell and tissue culture – History and scope – advantages and disadvantages, laboratory facilities, the substrate, culture media and culture procedures. Primary culture, cell lines, maintenance of cultures, cell lines. Cloning of cell lines. Cancer cell lines.

Unit II- STERILIZATION AND PREPARATION OF MEDIA **20 hrs**

Preparation and Sterilization of cell culture media and reagents. Introduction to the balance salt solutions and simple growth medium. Chemical, physical and metabolic functions of different constituents of culture media. Role of carbon dioxide in animal cell culture.

Unit III- TISSUE CULTURE **20 hrs**

Tissue culture- slide, flask and test tube culture. Embryo culture, Organ culture, Somatic cell hybridization and expression of cloned genes in cultured cells. Stem cells – isolation, identification, expansion, differentiation and uses. Stem cell engineering.

Unit IV- CHARACTERIZATION OF CULTURED CELLS **15 hrs**

Role of serum and supplements, Serum & protein free defined media and their applications. Measurement of viability and cytotoxicity. Biology and characterization of cultured cells, measuring parameters of growth.

Unit V- TRANSGENIC ANIMALS

15 hrs

Methods for producing transgenic mice, Retroviral, DNA microinjection and engineered stem cell methods. Applications of transgenic mice. Transgenic cattle, sheep, goats, pigs and fish. Transgenic animals as models of human disease.

Books for study

1. Animal Cell Culture Techniques. Ed. Martin Clynes, Springer.
2. Animal Biotechnology, M. M. Ranga, III Revised edition, Agrobios (India), Jodhpur.
3. Animal Cell Culture- Practical Approach. John, R.W. Masters. 2000. 3rd Edi.

Books for Reference

1. Freshney. Culture of Animal Cells: A manual of basic techniques. 4th ed. Wiley – Liss 2000.
2. Culture of Animal cells, 3rd Edition, R. Ian Freshney. A John Wiley & Sons, Inc., publications.
3. Animal Cell Culture- Practical Approach, R.W. Masters, Oxford.
4. Animal Cell Biotechnology, Methods and protocols, Nigel Jenkins, Humana Press.
5. Biotechnology of Animal Tissue. P.R. Yadav & Rajiv Tyagi. 2006. Discovery Publishing House. New Delhi.

**SEMESTER – II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BI2001	ANALYTICAL TECHNIQUES	5	5

Objectives:

The objective is to educate the students on the basic principles, instrumentation and applications of the analytical tools of biochemistry

Unit I - SPECTROSCOPY

15 Hrs

Laws of absorption and absorption spectrum. Principle, instrumentation and applications of UV-visible, FT-IR spectroscopy and spectro-fluorimetry. Principle, instrumentation and applications of Luminometry, Turbidometry & Nephelometry. Atomic spectroscopy. Flame and flameless spectrophotometry. Basic principles of NMR, ESR and mass spectrometry and their biological applications. X-ray diffraction, ORD and CD-elementary details.

Unit II - RADIOISOTOPE TECHNIQUES & MICROSCOPY

15 Hrs

Nature and Units of radioactivity. Stable and radioisotopes. Detection and measurement of radioactivity- Geiger-Muller counter, solid and liquid scintillation counting, quenching and quench correction, scintillation cocktails and sample preparation Cerenkov counting. Autoradiography. Applications of radioisotopes in biology- Radiation hazards.

Microscopy – Basic principles. Light, bright field, phase – contrast and fluorescence microscopy. Electron microscopy – preparation of specimens. TEM and SEM. Microtomy. Fixation and staining. Flow cytometry, FACS.

Unit III - ELECTROPHORESIS AND BLOTTING TECHNIQUES

15 Hrs

Electrophoresis: General principles, support media. Electrophoresis of proteins- SDS-PAGE, native gels, gradient gel, isoelectric focusing, 2-D PAGE. Cellulose acetate electrophoresis. Detection, estimation and recovery of proteins in gels. Electrophoresis of nucleic acids- agarose gel electrophoresis, PAGE, pulsed-field gel electrophoresis. Blotting techniques: Southern, Northern and Western

blotting techniques. DNA fingerprinting and foot printing, Elementary details of Biosensors.

Unit IV - CHROMATOGRAPHY

15 Hrs

Principle, instrumentation and applications of thin layer, gas, ion-exchange chromatography. Chromatofocusing. Molecular exclusion and affinity chromatography- principle, gel preparation, operation and application, Special forms of Affinity chromatography, Immuno affinity, Metal chelation, Dye-Ligand & Covalent Chromatography. HPLC-principle, instrumentation and applications. Capillary electro-chromatography. HPTLC – principle and application.

Unit V - CENTRIFUGATION & TISSUE FRACTIONATION

15 Hrs

Basic principles of sedimentation. Low-speed and high-speed centrifuges. Ultracentrifuge: analytical and preparative ultracentrifuge- instrumentation and applications. Molecular weight determination by centrifugation. Subcellular fractionation by differential centrifugation. Density-gradient centrifugation- rate zonal and isopycnic. 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.

Books for Reference

1. Physical Biochemistry by David Friefielder, 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 Freifelder Physical Biochemistry – Applications to Biochemistry and Molecular Biology. WH Freeman & Co. 2nd edition 1999.

**SEMESTER – II
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BI2002	BIOENERGETICS AND METABOLISM	5	6

Objectives:

The objective of this paper is to make the students learn metabolic pathways of biomolecules and understand the interrelationship between the pathways and the mechanisms of regulation.

Unit I - BIOENERGETICS AND BIOLOGICAL OXIDATION 15 Hrs

Definition – Laws of Thermodynamics and its Applications, Free energy, Enthalpy and entropy, endergonic and exergonic reactions, Calculation of Free energy change in Biological Reactions. Phosphoryl group transfers and ATP. Enzymes involved in redox reactions. The electron transport chain- organization of respiratory chain complexes I, II, III, IV and electron flow.

Oxidative phosphorylation- electron transfer reactions in mitochondria. F₁F₀ ATPase- structure and mechanism of action. The chemiosmotic theory. Inhibitors of respiratory chain and oxidative phosphorylation- poisons, uncouplers and ionophores. Regulation of oxidative phosphorylation.

Mitochondrial transport systems- ATP/ADP exchange, malate/glycerophosphate shuttle, creatine-phosphate shuttle, Serine –P shuttle.

Unit II - CARBOHYDRATE METABOLISM 15 Hrs

Overview of glycolysis and gluconeogenesis- Regulation. The citric acid cycle and regulation. The pentose phosphate pathway and uronic acid pathway. Significance. Metabolism of glycogen and regulation. Metabolism of galactose and fructose. The glyoxylate cycle. Cori cycle.

Photosynthesis- photosynthetic apparatus, light reaction, cyclic and noncyclic photophosphorylation. Dark reaction- Calvin cycle, Hatch-Slack pathway. Photorespiration. Starch biosynthesis and degradation. Bioluminescence.

Unit III- LIPID METABOLISM

15 Hrs

Oxidation of fatty acids- role of carnitine in fatty acid transport, α , β and ω -oxidation. Metabolism of ketone bodies. Biosynthesis of fatty acids - Fatty acid synthase complex – regulation of lipogenesis. Metabolism of triglycerides, phospholipids and sphingolipids. Cholesterol- biosynthesis, regulation, transport and excretion. Metabolism of lipoproteins. Metabolism of prostaglandins – COX and LOX pathways.

Unit IV- AMINO ACID, PURINE AND PYRIMIDINE METABOLISM 15 Hrs

Overview of biosynthesis of 20 amino acids found in proteins - Amino acids from Ser family (gly), pyruvate family (leu), aspartate family (lys), glutamate family (gln), aromatic amino acid family (trp) and histidine family (his). Catabolism of amino acid nitrogen- transamination, deamination, ammonia formation and the urea cycle. Catabolism of carbon skeletons of amino acids. Conversion of amino acids to special products.

Metabolism of purines- de novo and salvage pathways for biosynthesis. Purine catabolism. Biosynthesis and catabolism of pyrimidines. Regulation of purine and pyrimidine metabolism.

Unit V-PORPHYRINS, MINERALS AND METABOLIC INTEGRATION

15 Hrs

Biosynthesis and degradation of porphyrins and heme. Minerals- sources, daily allowance, absorption, metabolism, biological roles and clinical significance of calcium, phosphate and magnesium trace elements- metabolism of iron- absorption, storage, transport and excretion. Iron deficiency and overload. Copper, zinc, selenium, cobalt, manganese and fluoride.

Integration of metabolism – interconversion of major food stuffs. Metabolic profile of the liver, adipose tissue and brain. Altered metabolism in starvation.

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 Reference

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.

SEMESTER – II
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIPR21	PRACTICAL – III BIOCHEMICAL ANALYSIS OF BLOOD	4	6

Objectives: To have knowledge about the normal and abnormal biochemical constituent of blood.

1. Estimation of glucose by GOD & POD method
2. Estimation of Glucose by orthotoulidine method.
3. Estimation of serum total proteins & A: G ratio
4. Estimation of blood urea
5. Estimation of serum uric acid
6. Estimation of serum creatinine.
7. Estimation of serum triglycerides.
8. Estimation of serum cholesterol.
9. Estimation of lipoproteins.
10. Estimation of serum calcium.
11. Estimation of serum bilirubin.
12. Estimation of serum phospholipids.
13. Estimation of Vit-A, E & C
14. GTT
15. Demonstration of Auto Analyser.

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 Reference

1. Laboratory manual in Biochemistry – Jayaraman
2. Biochemical methods – S. Sadasivan and Manickam

SEMESTER – II
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIPR22	PRACTICAL –IV HEMATOLOGY AND SEROLOGY	4	5

Objectives: To have knowledge of blood cells count and investigation of human viral diseases.

HEMATOLOGICAL STUDIES

1. Collection of Blood
2. Estimation of hemoglobin content.
3. Total RBC count.
4. Total WBC count.
5. Calculation of RBC indices : MCV, MCH, MCHC
6. Differential WBC count (DC).
7. Determination of Packed Cell Volume.
8. Absolute Eosinophil count (AEC).
9. Total platelet count.
10. Determination of bleeding time.
11. Determination of clotting time.
12. Determination of Prothrombin time.
13. Determination of ESR.
14. Grouping of blood and Rh typing.
15. Pathological examination of blood film.
16. Demonstration of cell counter.

SEROLOGICAL STUDIES

1. Widal Test.
2. VDRL Test.
3. CRP Test.
4. Rheumatoid arthritis Test.
5. HIV Test.
6. HBsAg Test.
7. Pregnancy Test
8. HbA1c Test
9. Demonstration of ELISA reader

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 Reference

1. Laboratory manual in Biochemistry – Jayaraman

SEMESTER – II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIE201	CELL SIGNALING AND COMMUNICATION	4	6

Objective: To understand various signaling pathways.

Unit I- SIGNALING COMPONENTS **20 hrs**

Fundamental concepts and definitions of signal, ligands, and receptors, Endocrine, paracrine and autocrine signaling. Receptors and signaling pathways – cell surface receptors, ion channels, G – protein coupled receptors, receptor kinases (tyr, ser/thr). Signal transduction through cytoplasmic and nuclear receptors. The Ras – raf – MAP kinase cascade. Second messengers – cyclic nucleotides, lipids and calcium ions. Crosstalk in signaling pathways.

Unit II- CELL SIGNALING **20 hrs**

Hormones and their receptors, regulation of signaling pathways, bacterial and plant two-component systems, light signaling in plants, bacterial chemotaxis and quorum sensing. Signal cascade, inhibitors of signal cascade.

Unit III- HOST PARASITE INTERACTION **20 hrs**

Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells, alteration of host cell behavior by pathogens, virus-induced cell transformation, pathogen-induced diseases in animals and plants, cell-cell fusion in both normal and abnormal cells.

Unit IV- CELLULAR COMMUNICATION **15 hrs**

Regulation of hematopoiesis, general principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins, neurotransmission and its regulation.

Unit V- CANCER

15 hrs

Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, virus-induced cancer, metastasis, interaction of cancer cells with normal cells, apoptosis, therapeutic interventions of uncontrolled cell growth.

Books for study

1. De Robertis and De Robertis. Cell and Molecular Biology. Lea and Febiger. 8th ed.
2. Cell biology Second edition – CA Smith & EJ Wood, Chapman & Hall publications
3. Murphy. Fundamentals of light microscopy and electron imaging. Wiley – Liss, 2001

Books for Reference

1. The biochemistry of cell signaling, Helmreich JM, Oxford press
2. Cell signaling – John T, Hancock Oxford University press
3. Lodish et al. Molecular Cell Biology. Scientific 5th ed. Freeman.
4. Molecular cell biology 4th Edition Harvey Lodish, Amoldberk, Newyork.

SEMESTER – II
(CORE BASED ELECTIVE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BIE202	NANO BIOCHEMISTRY	4	6

Objectives: This helps the students to understand the various nanomaterials, their construction and biological approach of the same in medical field.

Unit I - INTRODUCTION

15 Hrs

Nanotechnology – definition and scope, nanobiotechnology- recent development and applications, Bioconjugation mediated drug delivery, carbon nanotubes – types and their biomedical applications. Immunotoxin are targeted cell killers. General medicine is changing into personalized nanomedicine.

Unit II - BIOPOLYMER

15 Hrs

Biopolymer- classification and types, polymer nanofibers - electrospinning method and their biomedical applications, biocompatible polymer and their application in tissue engineering, polymer nanocomposite- bone and dental restorations, polymer controlled drug delivery for the treatment of cancer and other diseases. Biodegradable polymer derived from amino acid.

Unit III - BIOCOMPATIBLE NANOMATERIALS

15 Hrs

Metal Microbes interaction, Biological metal nanoparticle synthesis and biomedical application – Dendrimers, quantum dots, Biodegradable optical nanoparticles for tumor diagnosis and treatment. PLA and PLGA Based nanoparticulate delivery system.

Unit IV - NUCLEIC ACID BASED NANOMATERIALS

15 Hrs

DNA based artificial nanostructures; Fabrication, properties and application- Nucleic acid engineered nanomaterials and their applications. Protein patterning for applications in biomaterials. DNA lipoplexes – Lipofection efficiency In Vitro and In Vivo, Polymer controlled delivery of therapeutic nucleic acid.

Unit V - LIPOSPHERE IN DRUG TARGET AND DELIVERY

15 Hrs

Liposome - liposomes in sensor technology, polymeric Micelles – Production of Lipospheres for Bioactive compound delivery – Melt dispersion technique, Solvent evaporation technique and InVitro drug release - Polymeric biodegradable liposphere for vaccine delivery.

Books for study

1. Pradeep T, 2007, NANO: The Essentials – Understanding Nanoscience and Nanotechnology, TATA McGraw – Hill Education.
2. Nano Biology Veenita Singh
3. A Hand Book of Nano biotechnology Rita Khare.
4. Nano Biotechnology SubbiahBalaji.

Books for Reference

1. Challa S.S.R. Kumar (Ed). 2006. Biological and pharmaceutical nonmaterial's. Wiley-VCH VerlagGmbh& Co., KgaA.
2. K.K. Jain 2006 Nanobiotechnology in Molecular Diagnostics: Current Techniques and Application Horizon Biosciences.
3. Niemeyer, C.M. Mirking C.A., (Eds.) 2004 .Nano biotechnology concepts.
4. Applications and Perspectives, Wiley- VCH, Weinheim-2004
5. Claudio Nastruzzi – 2005 (Ed) Liposphere in drug targets and delivery, CRC press.
6. Molecular Design and Synthesis of Biomaterials Biological Engineering Division, MIT Open Course Ware, 27th May 2005
7. Biomaterials Sciences: An Introduction to Materials 2nd Edition, Buddy D.Ratner, Allan S.Hoffman, Frederick J.Schoen and Jack E.Lemons
8. Nanotechnology: A General Introduction to the Next Big Idea Mark Ratner and Daniel Ratner: Pearson Education Publishers, 2002
9. Encyclopedia of Nanoscience& Nanotechnology, H.S.Nalwa (Ed.,) American Scientific Publishers, California, 2004.
10. Nano Biotechnology: Concepts, applications and perspectives. ChristoferM.Niemayer, Chad A.Mirkin, Wiley VCH Publishers 2004.
11. Bionanotechnology: Lessons from Nature, David S.Goodsell, Jhon Wiley, 2006.
12. Nano-Biotechnology concepts, Application & Perspectives, Edited by C.M. Niemeyer, C.A.Mirkin, Wiley-VCH India Pvt. Ltd.

SYLLABUS
For
B.Sc. BIOTECHNOLOGY

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

**SEMESTER-III
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BT3001	BIOINSTRUMENTATION	7	CC07	7

UNIT-I

Basic laboratory equipments- Balance, Hotplate and Magnetic stirrer, Autoclave, Laminar air flow, Incubator, Hot air oven, Water bath and pH meter.

UNIT-II

Microscopy – Principles and Applications- Light microscope- Compound Microscope and Phase contrast microscope. Electron microscope- Transmission Electron Microscope(TEM), Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM).

UNIT-III

Centrifuge- Basic principles and Applications. Centrifuge types- Zonal, Density, Gradient Centrifuge, Differential Centrifuge. Electrophoretic apparatus.

UNIT-IV

Spectroscopy- Introduction – The regions of Spectrum- Characteristics of Electromagnetic radiation Absorption spectroscopy- Photoluminescence, Fourier transform infrared spectroscopy, Raman spectroscopy, UV and Visible spectroscopy.

UNIT-V

Methods of sample preparation – Chemical fixation technique, cytofixation, Dehydration, Staining, Mechanical milling, Chemical etching, Ion etching, Conductive coating. Chromatography- Column and Thin layer Chromatography- PCR

Books Recommended

1. Biochemistry, Vote, D and Vote, J.G.(2007), Second edition. John wiely & Sons
2. Bioinstrumentation, John Webster, (2004). John weily & Sons
3. Bioinstrumentation, Veerakumari (2012). First edition. MJP Publisher
4. Molecular Biology of the Gene, James , D.Watson Hopkins N.H.Robert, J.W & Steitz, J.A

SEMESTER-III
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTPR31	PRACTICAL III BIOINSTRUMENTATION	1	CC08	2

1. Study of Compound Microscope. Observation of microbial samples.
2. Isolation of DNA- animal/ plant tissues by Centrifugation.
3. Separation of DNA by electrophoretic apparatus
4. Separation of Aminoacids/Plant pigments by Thin layer Chromatography.
5. Analysis of DNA samples in UV Spectrophotometer
6. PCR- Technique demonstration.

References

1. Practical Biochemistry – David plummer- Tata macraw Hill (2007)
2. Light microscopy in Biology- A.J.Laccy (2001)
3. Instrumental methods of Chemical analysis- B.K.Sharma and Goel (1998).

**SEMESTER-III
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTAL31	ALLIED BIOSTATISTICS	6	CC09	7

Objectives: *Basic principles of statistical analysis with reference to Biological sample.*

Unit 1: Role of Biostatistics - statistics and biostatistics - role of biostatistics in modern medicine - Biostatistics for Epidemiology.

Unit 2: Population, Sample, variable, parameter, primary and secondary data, screening and representation of data. Frequency distribution, tabulation, bar diagram, histograms, pie diagram, cumulative frequency curves.

Unit 3. Mean, median, mode, quartiles and percentiles, measures of dispersion: range, variance, standard deviation, coefficient of variation, symmetry: measures of skewness and kurtosis.

Unit 4: Hypothesis Testing Student T and Chi-square test - Probability and Distribution Concepts and problems on probability, Binomial, Poisson, Normal Distribution and their Applications

Unit 5: Application of Biostatistics: Introduction to MSEXCEL-Use of worksheet to enter data, edit data, copy data, move data. Use of in-built statistical functions for computations of Mean, S.D., Correlation, regression coefficients etc. Use of bar diagram, histogram, scatter plots. Graphical tools in EXCEL for presentation of data.

REFERENCE BOOKS:

1. Bliss, C.J.K. (1997) Statistics in Biology, Vol. I Mc Graw hill. New York.
2. Campbell R.C. (2003) Statistics for Biologists, Cambridge Univ, Press, Cambridge
3. Daniel (1999) Biostatistics (3rd edition) Panima Publishing, Compotation
4. Sward law,A.C.(2005) Practical Statistics for Exponents Biologists, John Wiley and Sons, In
5. Khan (2004) Fundamentals of Biostatistics Publishing corporation
6. Textbook of Biostatistics-Saras Publication (2012)

SEMESTER-III
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTAP31	ALLIED PRACTICAL-BIOSTATISTICS	1	AEC3	2

1. Principles of statistical sampling from a population
2. Random sampling
3. Collection of primary data and secondary data
4. Diagrammatic and Graphical representation of Data
5. Calculation of Mean, Calculation of Median, Calculation of Mode – using
Neem leaves / Fish
6. Correlation and Regression analysis
7. Computational exercise for Mark sheet preparation
8. Computer exercise for Graphical Tools – Line, Bar, Histogram, Pie diagram

**SEMESTER-IV
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BT4001	IMMUNOLOGY	7	CC10	7

Objectives: *To focus the immunological principles, immunity with reference to human.*

UNIT – 1:

History and scope of immunology – Immune system , Anatomy of Lymphoid organs– Primary and secondary organs – Immunity – Innate and acquired immunity. Active and Passive immunity- Humoral and Cell mediated immunity- Specific, Non specific, Genetic, Racial and Cellular immunity.

UNIT – 2:

Antigen and antigenicity – Characters – Epitope, Paratope, Cross reactive antigens. Antigen – Antibody reactions – Types – Agglutination, Precipitation, Cytolysis, Complement fixation, Opsonization and Immunofluorescence.

UNIT – 3:

Immunoglobulins – types – structure and functions, Production, purification and Quantification of Immunoglobulins- Monoclonal antibodies – Hybridoma technology and its applications- Immuno diagnosis and applications.

UNIT – 4:

B-cells and Humoral immunity, B-cell activation and proliferation, Macrophages- Plasma cells and memory cells -Isolation and Characterization of T-Cell subsets- Cell mediated immunity – T-cell activation. Role of T-helper and cytotoxic cells. Cell mediated immunity to bacteria, viruses, interleukins, interferons and lymphokines- Vaccines technology and DNA Vaccines

UNIT – 5:

Transplantation immunology – Autograft and allograft rejection. Hyper sensitivity reactions – Immune suppression in transplantation. Tumor Immunology and Auto immune diseases – Hemolytic anaemia, Thrombocytopenia, Lupus erythematosus – AIDS.

REFERENCES:

1. Immunology – Kuby (2013)
2. Essential Immunology – Ivan Roitt (2010)
3. Immunology – An introduction – T. Zard (2004)
4. Immunology- R.A.Goldsby, Thomas J, Kindt .A 2008. W.H.Freeman Company
5. Immunobiology – Janeway CA & Paul Travers (1994)
6. Immunological Techniques, D.M.Weir,1992
7. Basic and Clinical Immunology, D.P.Stites and J.D. Stobo (1998)

SEMESTER-IV
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTPR41	PRACTICAL IV –IMMUNOLOGY	1	CC11	2

1. Blood Grouping
2. Blood Cell Analysis
3. Handling of Laboratory Animals – Mouse & Rabbit
4. Routes of Inoculation
5. Methods of Bleeding
6. Immuno Diffusion – Singles Radial Immuno Diffusion
7. Antigen – Antibody Reactions – Widal Test

**SEMESTER-IV
(ALLIED PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTAL41	ALLIED FOOD PROCESSING TECHNOLOGY	6	CC12	7

Objectives:

To study methods of food processing and preservation

To impart knowledge of different methods of fruits and vegetable processing.

To understand various technologies in food processing

Unit I: Introduction to food processing:

Introduction; scope and importance; basic concepts about properties of foods: liquid, solid and gases. **Food Analysis** Principles of analysis of various food constituents and subsequent changes on packaging; sensory attributes of foods: mechanisms of sensation and perception of colour, taste, odour, and flavour; importance and use of sensory evaluation methods; selection of trained panelists.

Unit II: Principles of Food Processing:

Processing at ambient temperatures (size reduction, mixing and forming, separation and concentration of food components, irradiation); Processing at high temperatures (pasteurization, heat sterilization, evaporation, distillation, extrusion, dehydration, baking, roasting, frying, dielectric heating, and infrared heating); Processing by removal of heat (chilling, controlled and modified-atmosphere storage, freezing, freeze drying and freeze concentration):

Unit III: Processing of foods: Processing of fruit juices (selection, juice extraction, deaeration, straining, filtration and clarification), preservation of fruit juices (pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation) – **Quality control:** Quality assurance, quality control, good manufacturing practices, safety, hazards, risk; HACCP: principles of HACCP, overview of biological, chemical and physical hazard in foods, ISO:9000 series and ISO:14000 series, Agmark, ISI and Food Safety Act.

Unit IV: Packaging and Storage Technologies

Forms of packaging: wooden boxes, crates, plywood, wire bound boxes, corrugated and fiber board boxes, bottle, tetra, retortable, flexible and laminated pouches, shrink, vacuum, gas, CAP, MAP, wrappers, textile bags, aseptic etc;

Unit V:Emerging Technologies in Food Processing

High Pressure Processing- Effects of high pressure on food quality; Pulsed electric fields processing; Osmotic dehydration - Processing by radio frequency electric fields - Ultrasound processing - Hybrid drying technologies

Text/ Referances:

1. Sun, Da-Wen, *Emerging Technologies for Food Processing*, Academic Press, 2005.
2. Paul Singh R, *Introduction to food engineering*, Academic Press. B 2000.
3. Bhatnagar D and Cleveland T, *Molecular approaches to improving food quality and safety*, Van Noost and Reinhold, New York- 1992
4. SumaaHantti, Uma Varma, *Fruit and vegetable processing*, CBS Publishers (2007)
5. De SUkumar , *Outlines of Dairy Technogy*OxofordUniverstiy press, New Delhi (2001)

SEMESTER-IV
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BTAP41	ALLIED PRACTICAL -FOOD PROCESSING TECHNOLOGY	1	AEC4	2

1. Analysis of food constituents
2. Processing of any two foods and fruits
3. Processing and preservation of fruit juice
4. Processing and preservation of fruit jam
5. Preparation of cheese and butter
6. Visit to any food processing company

SYLLABUS
For
M.Sc. BIOTECHNOLOGY

SEMESTERS – I & II

(UNDER CBCS)

2016-2017

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BT1001	ADVANCED BIOCHEMISTRY	5	6

Unit – 1

Carbohydrate structure, Chemistry and Classification – Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. Glycolysis, TCA cycle, Gluconeogenesis and HMP shunt.

Unit – 2

Lipids, Fatty acids, Glycerol, Triacylglycerol structure and Classification of Lipids. B oxidation of lipids, Ketogenesis, Fatty acid synthesis, Cholesterol biosynthesis.

Unit – 3

Amino acid structure and Classification of Protein, Structure – Primary, secondary, tertiary and quaternary. Amino acid metabolism – Transamination, Deamination, Decarboxylation, ammonia formation and Urea cycle.

Unit – 4

Nucleic acid structure – Purine, Pyrimidine bases, DNA, RNA types – ABZ forms of DNA, ribosomal RNA, messenger RNA and transfer RNA. Purine, Pyrimidine biosynthesis – Denovo and salvage pathways.

Unit – 5

Enzyme classification, Mechanism of action, kinetics – Michaelis Menten equation. ATP structure. Mitochondrial Electron Transport Chain, Inhibitors of ETC.

Reference

1. Harper's Biochemistry, 26th edition, Murray et al 2003, McGraw Hills.
2. Principles of Biochemistry, Leninger et al, 1993, Worth Publishers, New York.
3. Text Book of Medical Biochemistry, 4th edition, 2000 Chatterjea and Shinde, Jaypee Publishers, New Delhi.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BT1002	CELL AND MOLECULAR BIOLOGY	5	6

UNIT-I

Introduction to Molecular Biology, Cell Cycle – Meiosis and Mitosis, DNA – Denaturation and Renaturation, C value paradox, cell membrane architecture, Cell signaling – Communication between the cell and their environment, second messenger (plant and animal) and G – protein coupled receptors, receptors of tyrosine kinase.

UNIT-II

Replication, Modes of Replication - Conservative, Semi conservative, dispersive methods and its experimental evidences. Prokaryotic and Eukaryotic replication, Mechanism of DNA replication- Enzyme and accessory protein involved in DNA replication –DNA repair and regulation of Gene expression- Polymerase, Primers and mechanism. Polymerase Chain Reaction and its types, Taq polymerase, Topoisomerase. Thermo cycler.

UNIT-III

Transcription - Prokaryotic and Eukaryotic transcription, mechanism of transcription, RNA polymerase and its types, General and specific regulatory elements and mechanism of transcription regulation- transcription factors, Post transcriptional modifications – capping, polyadenylation, introns, exons, splicing, Alternate splicing- Transcriptional and Post transcriptional gene silencing.

UNIT-IV

Translation – Genetic code, Deciphering of genetic code, Prokaryotic and Eukaryotic translation, Ribosomes, aminoacyl synthetase, post translational modification- Mechanism of Translation, Initiation, Elongation and Termination- Regulation of Translation- Receptor mediated endocytosis.

UNIT-V

DNA repair and Protein localization – DNA repair and recombination. Chaperons and protein folding, nuclear localization signals for nucleus, mitochondria, chloroplast, Golgi, endoplasmic reticulum, membrane and secretory proteins and targeting- Molecular mapping of genome- Genetical and Physical map- Application of RFLP in forensic and disease diagnosis.

Reference:

1. Molecular Cell Biology, Media connected W.H. Freeman and company.
2. Molecular Biology of Gene by Watson JD, Hopkins NH, Roberts JW, Steitz JA, Weiner AM. (2004). The Benjamin / Cummings Publishing Company.
3. Cell and molecular biology – concept and experiment. 2nd edn, Harris, D[ed], Karp, G.1999. John wiley & sons, sons, New York.
4. Microbial Genetics by S.R. Maloy, J.E. Cronan and D. Friefelder (1994) Jones and Bartlett publishers.
5. Genes VII by Levin. (2004) Oxford University press.
6. An introduction to genetic Analysis by A.J Griffiths, J.H Miller, D.T. Suzuki, R.C Lewontin and W.M Gelbart (2000) W.H Freeman Company.
7. Principles of Genetics by D.P Snustad, M.J. Simmons and J.B. Jenkins. (1997) John wiley and sons.
8. Principle of cell and molecular biology. 2nd edn., Mclaughlin,S., Trost, K., Mac Elree, E.[eds]., Kleinsmith, L.j.& Kish, V.M., 1995. Harper Collins Publisher, New York.
9. Molecular biology of the cell. 3rd edn., Alberts, B., Bray, D., Lawis, J., Raff, M., Roberta, K., Watson, J.d[eds], 1994. Garland Publication, Inc., New York.
10. Cell and Molecular Biology, Peter Paoella, m 1998. Mc Graw- Hill.

**I SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTPR11	PRACTICAL I ADVANCED BIOCHEMISTRY	4	6

1. Estimation of DNA using diphenylamine method.
2. Estimation of total soluble sugars.
3. Estimation of protein by Lowry's method.
4. Estimation of RNA using orcinol.
5. Separation and identification of sugars and amino acids by chromatography.
6. Separation of plant pigments column chromatography.
7. Qualitative analysis of urine.
8. Qualitative analysis of Aminoacids

**I SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTPR12	PRACTICAL II CELL MOLECULAR BIOLOGY	4	6

1. Observation of prokaryotic and eukaryotic cells – Living cells/ Temporary and Permanent preparations.
2. Squash preparation of giant chromosome of salivary gland of chironomous larva.
3. Squash preparation and observation of mitosis in onion root tip
4. Squash preparation and observation of meiosis in testis and anther lobes.
5. Sub cellular fractionation using differential centrifugation.
6. Cell size measurement using micrometry.
7. Isolation of chromosomal DNA from Bacteria.
8. Bacterial conjugation-**Demonstration**
9. Bacterial transformation- **Demonstration**
- 10 DNA ligation- **Demonstration**
- 11 Restriction digestion- **Demonstration**

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTE101	BIOPROSPECTING TECHNOLOGY	4	6

UNIT-I

Classification of crude drugs – Schemes for pharmacognostic studies of a crude drug; Phytopharmaceuticals – commercial significance of herbal products – current trend of market.

UNIT-II

Herbal products: carbohydrates and derived products – drugs containing glycosides, tannins, lipids [fixed oils, fats and waxes], volatile oils and terpenoids, enzymes and proteins, alkaloids – Marine drugs.

UNIT-III

Analytical pharmacognosy; Drug adulteration – types – methods of drug evaluation; Biological testing of herbal drugs – preliminary phytochemical screening for plant products tests – Chromatography [TLC, GLC, and HPLC]

UNIT-IV

Intellectual property rights – TRIP international conventions patents and methods of application of patents – legal implications biodiversity and farmer rights – beneficial application and development of research focus of the need of the poor – identification of direction for yield effects in agriculture – aquaculture and bioremediation

UNIT-V

Objectives of the patent system – basis principle and general requirements of patent law- biotechnological inventions and patent law- legal development – patentable subjects and protection in biotechnology – The patentability of microorganisms – IPR an WTO regime- consumer protection an plant generic resources – GATT and TRIPS

Reference:

1. A Lexicon of medical plants in India, D.N. Guhabakshi, P.Sensarma and D.C.Pal, 1999. Naya prokash – publications.
2. Ethnobotany The Renaissance of Traditional Herbal Medicine, Rajiv K.Sinha, 1996. INA SHREE publishers.
3. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984 International Book Distributors.
4. Herbal plants and Drugs, Agnes Arber, 1999. Mangal Deep Publications.
5. Contribution to India Ethnobotany by Editor S.K.Jain, 1991 Scientific Publishers.
6. New Natural products and Plants drugs with Pharmacological, Biological (or) Therapeutical activity, H.Wagner and P. Wolff, 1979. Springer, New Delhi.
7. Ayurvedic drugs and their plant source, V.V.Sivarajan and Balachandran India 1994. Oxford IBH publishing Co.
8. Ayurveda and Aromatherapy, Miller, Light and Miller, Bryan, 1988. Banarsidass Delhi.
9. Principles of Ayurveda, Anne Green, 2000. Thorsons, London.
10. Pharmacognosy, Dr.C.K.Kokate et al.1999. Nirali Prakashan.
11. Biotechnology and Patent protection, Beier, F.K., Crespi, R.S.and Straus, 1980.Oxford and IBH Publishing Co, New Delhi.

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTE102	BIOINSTRUMENTATION	4	6

Unit 1: Introduction to Biophysics & Quantum mechanics. Biomolecular Techniques: Principles, working and application of PCR, Reverse Transcriptase PCR, Real Time PCR, RAPD, RFLP, AFLP, DNA Fingerprinting, Automated DNA - sequencer, ELISA, Western blotting, Southern Blotting, Northern Blotting, GEL Documentation unit. Biomedical instrument – ECG, EEG, CT and MRI.

Unit 2: Microscopic Techniques: Principles of Microscopy – Light microscope, phase contrast, fluorescence, dark field, confocal, Inverted, Scanning Electron Microscope, Transmission Electron Microscope. Genetic Engineering Tools - Microinjection, Electroporation, Particle Bombardment.

Unit 3: Pulse – chase techniques: Radioactive isotope and Half-life & isotope; Meselson and Stahl experiment, autoradiography. Cerenkov radiation. Counting techniques – solid scintillating counter, liquid scintillating counter, photomultiplier tubes, phosphor imaging. Green Fluorescence protein. FACS.

Unit 4: Separation Techniques: Chromatography - Principles and application of ion exchange chromatography, affinity chromatography, column chromatography, gas chromatography, gel exclusion chromatography, FPLC and HPLC. Electrophoresis – types, AGE, SDS PAGE, Gradient Gel Electrophoresis, Capillary Electrophoresis and MALDI TOF. Centrifugation (Velocity and buoyant density) and its types – Ultra centrifugation, Differential, Density gradient centrifugation.

Unit 5: Spectroscopic techniques: Principles and application of UV – Vis, Infra - red, FTIR, Laser, Electromagnetic, Nuclear Magnetic Resonance, Mass spectrometry, GC-MS, LC – MS. X –ray Diffraction, CD, Dynamic Light Scattering techniques.

Reference Books:

1. Biophysical Chemistry by Canter and Canter (1996).
2. Molecular Biotechnology by Glick and Pasternak. ASM Press (1994).
3. Biophysical Chemistry, David Friefelder
4. Bioanalytical Techniques by M.L Srivastava. (2008)
5. Physical Chemistry by Puri & Sharma
6. Physical Chemistry by P.L Soni, S. Chand Publication

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BT2001	PLANT AND ANIMAL BIOTECHNOLOGY	5	5

Unit I

Different culture methods and regeneration protocols for plants; production of haploids, plant hormones and their role in development; embryo culture and embryo rescue technique; Artificial seeds; Protoplast culture and fusion; regeneration of hybrid plants, cybrids.

Unit II

cryopreservation, slow growth and DNA banks for germplasm conservation. Role of DNA markers with special emphasis on RFLPs, linkage analysis, RAPD markers, STS, EST, microsatellites, SCAR, SSCP, AFLP, map based cloning.

Unit III

Transgenic organisms- vector and transformation in plants, transgene stability. Use of ACC synthase, polygalacturanase, ACC oxidase, male sterile lines. Applications of plant transformation for productivity, performance and resistance to insects, nematodes, virus.

Unit IV

Basic techniques of scale up of animal cell culture: roller bottles modification of roller bottles, multiunit system and concept of bioreactors including hollow fiber system & their application. Preservation and maintenance of animal cell lines.

Unit V

Transgenic animals, in vitro fertilization and embryo transfer. Molecular biological techniques for rapid diagnosis of genetic diseases and gene therapy. Ethical issues in animal biotechnology

Reference Books

1. Plant Biotechnology: J. Hammond, P. McGarvey and V Yusibov (Eds):, Springer Verlag, 2000
2. Plant Cell and Tissue Culture for the Production of Food Ingredients: T-J, Fu, G. Singh, and W R Curtis (Eds.), Kluwer Academic/Plenum Press. 1999.
3. Elements of Biotechnology: P K Gupta, Rastogi and Co. Meerut, 2007.
4. An Introduction to Plant Tissue Culture: M K Razdan. Tata Mc Graw Hill Publishing Co. Ltd. 2004
5. The Animal Cell Culture and Technology - Butler M
6. Culture of Animal Cells -Freshney RT

**II SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTPR21	PRACTICAL III PLANT AND ANIMAL BIOTECHNOLOGY	4	6

1. Sterilization techniques in Plant tissue culture.
2. Preparation of Plant tissue culture media.
3. Callus culture.
4. Isolation of Protoplast
5. Protoplast viability test
6. Immobilization of Plant enzymes.
7. Preparation of Animal tissue culture media.
8. Primary cell culture.
9. Isolation of DNA from animal source.
10. Isolation of RNA from animal source.
11. Silver staining of protein-**Demonstration**
12. Southern Blotting- **Demonstration**

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BT2002	MICROBIOLOGY AND MICROBIAL BIOTECHNOLOGY	5	6

UNIT-1

Scope and history of microbial biotechnology - Classification and general characteristics of microorganisms: Prokaryotic domains - Bacteria (proteobacteria, non proteobacteria) and Archaea – Eukaryotic domain: Fungi, algae, protozoa and helminthes – Viruses - Five kingdom concept of classification - Prokaryotic and Eukaryotic cell structure

Microscopy: Light, Fluorescence, electron and laser optic system micrometry.

UNIT-2

Culture Techniques: pure culture techniques– isolation, cultivation, enumeration and preservation of microbes - staining techniques: simple and differential staining.

Nutritional requirements and nutritional grouping of microorganism: Different media (simple, complex and defined) - Growth curve - Axenic culture - Synchronous culture - Continuous culture - Effects of physical and chemical factors on microbial growth.

Microbial genetics: recombination– transformation – transduction - conjugation- regulation of gene expression.

UNIT-3

Microbial diversity: Methods to assess microbial diversity, merits and demerits; Culture dependent and culture independent methods. Molecular analysis of bacterial community; Denaturing Gradient Gel Electrophoresis(DGGE), Terminal Restricts Fragment Length Polymorphism (T-RFLP), Amplified Ribosomal DNA and Restricts Analysis (ARDRA) - RAPD.

UNIT-4

Microbes in natural habitats: air, water & soil - Industrial application of microbes: Wine, Beer, Cheese, Yogurt; Primary and secondary metabolites and their application – biogas - bio-fertilizers and bio-pesticides - Leaching of ores microorganisms - microorganism and pollution control-bioremediation; biosensors.

UNIT-5

Microbial pathogenicity - toxins, mode of action, Bacterial pathogens – Staphylococcus, Streptococcus, Escherichia, Salmonella & Mycobacterium. Viral pathogens – Influenza, rabies, Enterovirus, Oncogenic viruses.

Control of microorganisms – physical and chemical methods – antibiotics and chemotherapeutic agents – antimicrobial susceptibility test.

References:

1. Microbiology, L.M. Prescott, J.P. Harley and D.A. Klein, 7thEdn, 2007. McGraw Hill. Boston.
2. Microbiology, L.M. Prescott, J.P. Harley and D.A. Klein, 6thEdn, 2005. McGraw Hill. Boston.
3. Fundamental principle of bacteriology, A.J. Salle, 1999. Tata McGraw Hill, New Delhi
4. Medical Microbiology, D. Greenwood, R. Slack and J. Peutherer, 1997. EIST with Churchill Livingstone, Hong Kong.
5. Microbial Ecology. Fundamentals and Applications, R.M. Atals and R. Bartha, 2000.
6. Microbiology, M.J. Pelzer Jr., E.C.S. Chan and N.R. Kreigh, 1993. McGraw Hill Inc. New York
7. Microbiology Functional Genomics, J.Zhou, D. K. Thompson, Y. Xu. J.M. Tiedje, J. Wiley, 2004.
8. Microbiology. An introduction. Tortora J.G., FUNke, R.B and Case L.C. 8th Edn.2005. Pearson Education (Singapore) Pte. Ltd.

**II SEMESTER
(CORE PRACTICAL PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTPR22	PRACTICAL IV MICROBIOLOGY AND MICROBIAL BIOTECHNOLOGY	5	6

1. Identification and enumeration of bacteria and fungi from soil, water and air
2. Staining techniques – acid fast, capsular and endospore staining
3. Biochemical tests for bacterial identification (IMViC test)
4. Identification fungal strains in contaminated food
5. Monitoring of bacterial growth
6. Isolation of axenic bacteria
7. UV induced mutagenesis
8. Isolation and identification of industrially important microbes
9. Microbial analysis of urine and blood
10. Antimicrobial assay

**II SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTE201	MOLECULAR GENETICS	4	5

Unit I: Genetic analysis of molecular biology-Genetic mutation, convention, terminology. Mutants-Number of mutations in a mutant. Uses of Mutants - Examples. Genetic analysis of mutants - Genetic recombination.

Unit II: Genetic material-central dogma - Genetic code and adaptor hypothesis - Identification of DNA as genetic material – Transformation experiments. Storage and transmission of genetic information by DNA. Ability of DNA to change mutation-Physical and chemical.

Unit III: Plasmids-General properties and types. Transfer of Plasmid DNA- Transfer process, plasmid replication. Properties of bacterial plasmids - Sex plasmids F and derivatives, drug resistance (R) plasmids, Col plasmids, Agrobacterium plasmids (Ti) plasmids in eukaryotes.

Unit IV Transposable Elements - Overview of transposition, Terminology. Types of Bacterial transposons. Transposition- duplication, structure of transposons, replication of transposons. Deletions and inversions by transposons, role of IS elements in Hfr formation. Transposable elements in eucaryotes-trasposition in eucaryotes.

Unit 5 Eukaryotic viruses – Basic structure of Eukaryotic viruses, viral nucleic acids, Basic life cycle of virulent viruses. Animal RNA viruses - Viral polymerases, Polio viruses, Reo viruses, Retroviruses. Animal DNA Viruses - Polyoma and SV40, Infectious DNA. Tumor viruses and Oncogenes-Oncogenes in cancer cells, Carcinogenes and Oncogenes, activation of Oncogenes.

BOOKS RECOMMENDED

1. Molecular Biology IInd edition- David Freifelder, Narosa publishing house, Newdelhi
2. Genes VIII- Benjamin Lewin
3. Molecular Biology & Biotechnology- HD kumar, Vikas publishing house PVT. Ltd, New delhi.

**II SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6BTE202	HERBAL BIOTECHNOLOGY	4	5

Unit I: General Introduction:

Definition, source of herbal raw materials, identification, authentication, standardization of medicinal plants as per WHO guidelines & different herbal pharmacopoeias. Collection and processing of herbal drugs. Seasonal & geographical variations; natural & artificial drying methods. Packaging & labeling of herbal drugs prior to extraction.

Unit 2: Standardizations:

Determination of physical and chemical constants such as extractive values, moisture content, volatile oil content, ash values, bitterness value and foreign matters applicable to the various herbal drugs.

Unit 3: Herbal Formulations:

Principle, methods, single herb formulation, poly-herbal formulation & their merits and demerits. Standardization of various herbal formulations.

Unit 4: Plant Tissue Culture Techniques & its Application in Pharmacy :

Introduction, techniques of initiation and maintenance of various types of cultures. Immobilized cell techniques & biotransformation studies including recent developments in production of biological active constituents in static, suspension and hairy root cultures.

Unit 5: Analysis of Bioactive Components of Natural Sources:

Phyto-chemical standardization of raw herbal extracts and their formulation by using TLC, HPTLC, GC, HPLC, UV & IR techniques.

BOOKS RECOMMENDED:

1. Herbal Drug Technology by S.S. Agrawal & M. Paridhavi
2. Modern Methods of Plant Analysis by Peach & Tracey
3. Biotechnology by S.S. Purohit
4. Quality control of herbal drugs: an approach to evaluation of botanicals by Pulok K. Mukherjee.
5. Pharmacognosy by C.K. Kokate, A.P. Purohit and S.B. Gokhale

SYLLABUS
For
B.Sc. COMPUTER SCIENCE
& SOFTWARE COMPUTER
SCIENCE

SEMESTERS – III & IV

(UNDER CBCS)

2016-2017

SEMESTER III
Common to B.Sc., (CS) / B.Sc., (S/W) / B.C.A.
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
U5CC3001	C++ & DATA STRUCTURES	7	7

Objectives: *To understand the concepts of object-oriented programming and master OOP using C++.*

UNIT-I : **12 Hours**

Principles of Object Oriented Programming – Beginning with C++ – Token , Expressions and Control Structures- Functions in C++ – Classes and Objects – Constructors and Destructors.(*Chapters:1,2,3,4,5&6*)

UNIT-II : **12 Hours**

Operator Overloading and Type Conversions – Inheritance : Extending Classes – Pointers, Virtual Functions and Polymorphism - Managing Console I/O Operations. Working with Files - Templates – Exception Handling – Manipulating Strings.(*Chapters: 7,8,9, 10,11,12,13&15*)

UNIT-III: **12 Hours**

Data Design & implementations: Different views of data – Abstraction and Built-in Types – Arrays

ADTs Stacks and Queue (Linear and Linked) , Stack (Array and Pointer)- Applications- Infix to Postfix Conversions – Queue(Array and Pointer) – List(Array and Pointer) – Applications: (Polynomial Addition) - Doubly Linked Lists. .(*Chapter 2:Section 2.1,2.2, Chapter 5:Section 5.1,5.2,5.3,5.4, Chapter 6: Section 6.3,6.6*)

UNIT – IV: **12 Hours**

Programming with Recursion : Recursion – Verifying and Writing Recursive Functions – **Binary Search Tree :** Implementation – Tree Traversal – **Graphs:** Implementations – BFS – DFS – Dijkstras Shortest Path Algorithm.(*Chapter 7:Section 7.1,7.4 7.5, Chapter 8:Section 8.1,8.4, Chapter 9:Section 9.3*)

UNIT-V:

Sorting and Searching Algorithms: Sorting – Searching – Hashing (*Chapter 10: Section 10.1,10.2,10.3*)

Total : 60 Hours

TEXT BOOK:

1. Object Oriented Programming with C++, E Balagurusamy , Tata McGraw Hill, 6th Edition, 2014.

(Units I, II)

2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers , 4th Edition, 2010.
(Units III, VI & V)

REFERENCES:

1. C++ The Complete Reference, Herbert Schildt, Tata McGraw Hill, 4th Edition, 2003.
2. OOP In ANSI C and Turbo C, Ashok N.Kamthene, Pearson Education, 6th Edition, 2008.
3. Data Structures and Algorithms, Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Addison Wesley Longman Inc., 2nd Edition, 1999.

SEMESTER III
Common to B.Sc.,(CS)/B.Sc (S/W) /B.C.A
(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
U5CCPR31	PRACTCAL III- DATA STRUCTURES USING C++ - LAB	1	2

Objectives:

To develop programming skills in design and implementation of data structures and their applications.

LIST OF LAB EXERCISES

1. Array implementation of Stack, Queue : Infix to postfix
2. Implementation of Stack, Queue, List, Doubly Linked List - using Pointers- Polynomial Arithmetic
3. Implementation of Binary Search Tree,
4. Implementation of Searching and Sorting Algorithms.
5. Graph Implementation, BFS, DFS,

REFERENCE :

Lab Manual

SEMESTER III
(ALLIED PHYSICS PAPER FOR COMPUTER SCIENCE ONLY)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAL31	ALLIED PHYSICS-I	6	CC09	7

Objective: This paper is offered to the students of Mathematics, Chemistry and Computer Science as Allied Subject. The logical reasoning behind the description of the physics problem and obtaining the solution to such problems are taught in this paper.

UNIT- I: Properties of Matter (2 Hours)

Elasticity: Hooke's law-Elastic constants – bending of beam – Bending moment – determination of Young's modulus by non-uniform bending.

Torsion: Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Rigidity Modulus – Determination of rigidity modulus by Torsional oscillation (without masses).

Surface Tension & Viscosity: Surface Tension –interfacial tension – determination of surface tension and interfacial tension by the method of drops - Co-efficient of viscosity of a liquid – Determination of ' η '.

UNIT- II: Heat (1 Hour)

Specific heat – Callender's and Barne's method to determine the specific heat 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- Kirchoff's laws of radiation.

UNIT– III: Electricity and Magnetism (1 Hour)

Electricity: Potentiometer – Principle – Calibration of low range voltmeter - Measurement of internal resistance of cell – measurement of an unknown resistance- Capacitance of a conductor - Capacitance of spherical and parallel plate capacitor – energy of a charge capacitor - Loss of energy due to sharing of charges

Magnetism –Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – period of oscillation

UNIT- IV: Sound (1 Hour)

Sound: Vibration of strings - Transverse vibration of strings - Velocity and frequency of vibrations of a stretched string – laws of vibrations along a stretched string – sonometer – A.C. Frequency - Steel wire – Brass wire. Ultrasonics – Production by Piezo – electric method – properties and uses- Reverberation – Reverberation time - Sabine’s formula [definition only]

UNIT- V: Optics (2 Hours)

Geometrical Optics: Spherical aberration- Condition for two thin lenses separated by a fixed distance –Chromatic aberration - Condition for two thin lenses in and out of contact- Achromatism in lenses.

Interference: Colors of thin films - Air Wedge –description – Experimental determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury lines using a grating by normal Incidence.

Polarisation: Optical activity –specific rotatory power – Determination of specific rotatory power of a solution using Laurent’s Half shade Polarimeter.

Books for study:

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005)
2. Allied Physics - Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics - N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing companies (1986).

Books for Reference:

1. Modern Physics –R. Murugesan S. Chand & Co.(2004)
2. Electronic Principles and applications – A. B. Bhattacharya, New Central Book Agency, Culcutta.
3. Introduction to Solid state Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
4. Renewable & sustainable energy sources – Agarwal.
5. Introduction to Fiber optics by K. Thyagarajan and Ajay Ghatak, Cambridge, University Press (1999)

SEMESTER III
(ALLIED PHYSICS PRACTICAL PAPER FOR COMPUTER SCIENCE ONLY)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAL31	ALLIED PHYSICS PRACTICAL-I	1	CC09	2

***Objective:** It is aimed to expose the Allied students about the techniques of handling simple measuring instruments and also makes them to understand mechanical and thermal properties.*

List of Experiments (Any Eight experiments only)

1. Young's Modulus – Non-uniform bending method - Pin and Microscope.
2. Rigidity Modulus – Torsional oscillations (without symmetric masses)
3. Determination of Co-efficient of viscosity – Graduated Burette.
4. Specific heat capacity of a liquid – Method of mixtures.
5. Sonometer – Determination of frequency of tuning fork (Screw Gauge is given)
6. Surface tension and interfacial surface tension – by drop weight method
7. Air wedge – Determination of thickness of a thin wire.
8. Spectrometer- Refractive index of a glass prism (minimum deviation)
9. Potentiometer – calibration of low range voltmeter.
10. Determination of 'm & M' using Deflection magnetometer (Tan-A Position).

Books for Reference

1. M.N. Srinivasan, S. Balasubramanian, R. Ranganathan, A Textbook of practical Physics, Sultan Chand & Sons
2. C.C Ouseph, G. Rangarajan, R. Balakrishnan- A Textbook of practical Physics-
S. Viswanathan Publisher-PartII (1996)

SEMESTER III

Common to B.Sc., (S/W) / B.C.A. (ALLIED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAL32	FINANCIAL ACCOUNTING – I	6	CC09/ EC09	7

Objectives:

To inculcate basic accounting knowledge to Computer Science students.

UNIT-I:

15 Hours

Introduction: Definition of Accounting – Attributes of Accounting – Book-keeping vs. Accounting – Groups Interested in Accounting Information – Methods of Accounting - Single Entry System vs. Double Entry System -Types of Accounts – Golden Rules of Accounting – Basic Accounting Concepts and Conventions- Accounting Equation – Journal – Meaning – Specimen Ruling of Journal – Construction of Journal Entries – Ledger – Meaning – Specimen Ruling of Ledger – Posting of Journal to Ledger – Balancing of Ledger Accounts – Distinction between Journal and Ledger.

(Chapter I : Sections 1.2; 1.2;1.3;1.7;1.9;1.10;1.12;2.12.1,2.18;2.19;2.23;2.24;2.26)

UNIT-II:

15 Hours

Subsidiary Books – Meaning and Purpose – Basic Documents required for Subsidiary Books – Purchase Book – Sales Book – Purchase Returns Book – Sales Returns Book – Cash Book (including Petty Cash Book) – Bills Receivable Book – Bills Payable Book – Journal Proper.

Bank Reconciliation Statement – Meaning and Need – Causes of Differences in Pass Book and Cash Book – Preparation of BRS. *(Chapter II Sections. 2.26;2.27;2.28;2.30;2.30;2.35;2.36;6.1;6.2;6.3)*

UNIT-III:

15 Hours

Trial Balance – Meaning – Objectives – Methods – Total Method – Balance Method – Schedule of Debtors – Schedule of Creditors – Preparation of Trail Balance. Errors – Types – Rectification of One-Side Errors – Rectification of Two Side Errors – Rectification through Suspense Account.

(Chapter III Sections 3.1;3.2;3.3;3.8;4.1;4.6;4.9;4.11.)

UNIT-IV:

15 Hours

Final Accounts – Meaning – Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Adjustment Entries. *(Chapter IV Sections 5.1; 5.3; 5.6; 5.11; 5.13)*

UNIT-V:**15 Hours**

Partnership- Fundamentals : Definition – Partnership Deed – Rules Applicable in the absence of Partnership Deed – Necessary Adjustment of Accounts-Capital Accounts of Partners.(Chapter V Sections. 21.1;21.2, 21.3;21.5)

Total : 75 Hours**TEXTBOOK:**

Financial Accounting, T.S. Reddy & A. Murthy, Margham Publications, 7th Edition, 2014.

REFERENCES:

1. Financial Accounting , R.L. Gupta & V.K. Gupta, Sultan Chand & Sons, 8th Edition, 2010.
2. Computer Applications in Business, S.R. Srinivasa Vallabhan, Sultan Chand & Sons, New Delhi.

SEMESTER III
Common to B.Sc., (S/W) / B.C.A.
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAP32	ALLIED PRACTICAL- ACCOUNTS LAB I	1	CC09/ EC09	2

LIST OF EXERCISES

1. Creation of New Company, Groups, Ledger.
2. Editing and Deleting Ledgers
3. Creation and Alteration of Voucher Entries
4. Trial Balance
5. Trading , Profit and Loss Account
6. Balance Sheet
7. Bank Reconciliation Statements
8. Interest Calculation.
9. Financial Functions I in Excel.
10. Statistical Functions I in Excel.

SEMESTER III

B.C.A.

(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BC3002	ENTERPRISE RESOURCE PLANNING	4	CC07	4

Objectives:

To develop the knowledge of business processes. To explain about how a business works , how information systems fit into business operations and how ERP software can improve the performance of these processes.

UNIT – I: BUSINESS FUNCTION AND BUSINESS PROCESS 15 Hours

Functional areas and Business Process- Functional area of operations – Business Process – Marketing sales – Supply Chain Management – Accounting and Finance – Human Resource – Functional areas of Information System. (*Chapter 1 : Section 1.1,1.2,1.3.*)

UNIT – II: MARKETING INFORMATION SYSTEM &SALES ORDER PROCESS IN ERP 15 Hours

Sales and Distribution in ERP – Pre Sales Activities – Sales Order Processing – Inventory Sourcing – Delivery – Billing – Payment – Customer Relationship Management – Benefits of CRM
(*Chapter 3 : Section 3.4,3.5,3.6*)

UNIT – III: PRODUCTION & SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEMS 15 Hours

Production Overview – The Production Planning Process – The SAP ERP Approach to Production Planning – Sales Forecasting – Sales and Operation Planning – Demand Management – Material Requirement Planning in SAP ERP – ERP and Suppliers – Supply Chain
(*Chapter 4 : Section 4.1,4.2,4.3,4.4.*)

UNIT – IV: ACCOUNTING IN ERP SYSTEMS 15 Hours

Accounting Activities – Using ERP for Accounting Information – Operational Decision Making problem - Credit Management – Industrial Credit Management in SAP ERP – Product Profitability Analysis – Management Reporting with ERP System – Document Flow for Customer Service
(*Chapter 5 : Section 5.1,5.2,5.3,5.4,5.5*)

UNIT – V: HUMAN RESOURCE PROCESS IN ERP 15 Hours

HR with ERP – Advance HR Features : Time management , Payroll , Travel management , Training and Development – Management By Objectives – ERP Process Modeling
(*Chapter 6 : Section 6.3,6.4,6.5 & Chapter 7 : Section 7.2*)

Total : 75 Hours

TEXT BOOK:

Enterprise Resource Planning, Ellen Monk & Bret Wagner, Cengage Learning India & Co, 3rd Ed. 2009.

REFERENCES:

1. Enterprise Resource Planning , Alexis Leon, Tata McGraw Hill, 2nd Edition, 2008
2. Enterprise Resource Planning, Mary Sumner, Pearson Education, 4th Edition, 2009

SEMESTER III

B.C.A.

(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BC3003	COMPUTER ORGANIZATION & ARCHITECTURE	4	CC08	4

UNIT – I

15 Hours

Data Representation: Fixed point representation – Floating point representation – Alphanumeric code. **Register Transfer and Micro operation:** Register Transfer Language – Register Transfer – Arithmetic Micro operation – Logic Micro operation – Shift Micro operation – Arithmetic Logic Shift Unit. (*Chapter 3: Sections: 3.3,3.4,3.5, Chapter 4: Sections: 4.1, 4.2, 4.4, 4.5, 4.6,4.7*)

UNIT – II

15 Hours

Basic Computer Organization and Design: Instruction Codes – Timing and Control – Computer Register – Instruction Cycle – Input-Output and Interrupt. **Micro-Programmed Control:** Control Memory – Address Sequencing – Design of Control Unit. (*Chapter 5: 5.1, 5.4, 5.2, 5.5,5.7, Chapter 7: Sections: 7.1, 7.2,7.4*)

UNIT – III

15 Hours

Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Programmed Control – Reduced Instruction Set Computer – CISC. (*Chapter 8: Sections: 8.2, 8.3, 8.4, 8.5, 8.6, 8.7,8.8*)

UNIT – IV

15 Hours

Computer Arithmetic: Addition and Subtraction – Multiplication Algorithm – Division Algorithm – Floating-point Arithmetic operation – Decimal Arithmetic Operations. **Input Output Organization:** Peripheral Devices – Input Output Interface – Asynchronous Data Transfer – Modes of Transfer – Direct Memory Access – Input Output Processor (IOP). (*Chapter 10: Sections: 10.2, 10.3, 10.4, 10.5,10.7, Chapter 11: Sections: 11.1,11.2, 11.3, 11.4, 11.6, 11.7*)

UNIT – V

15 Hours

Memory Organization: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory. **Multiprocessors:** Characteristics of Multiprocessors – interconnection Structures. (*Chapter 12: Sections: 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, Chapter 13: Sections: 13.1, 13.2*)

Total : 75 Hours

TEXT BOOKS

1. Computer System Architecture, M. Morris Mano , Third Edition, PHI, 2007.

REFERENCE BOOKS

1. Computer Architecture and Organization, Hayes. J. P., McGraw Hill, 2009.

SEMESTER III

B.C.A.

(SKILL BASED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BCSBP3	PRACTICAL IV INTERNET LAB	2	AEC3	4

LIST OF PRACTICALS:

1. Creation of a webpage using HTML5
2. Creation of a web page with frames , audio and video
3. Cascading Style sheet for designing the web page.
4. Design a dynamic web page using validation controls
5. Web page with Javascript
6. Web page with jQuery
7. Responsive Webpage
8. Webpage with prebuilt templates

REFERENCE:

Lab Manual

SEMESTER IV

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.

(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CC4001	PROGRAMMING IN JAVA	7	CC10/ CC09	7

Objectives:

To improve Object Oriented Programming gathered already through an independent platform.

UNIT - I: 15 Hours

OOP and Java-The Primaries – Control Statements – Arrays and Methods.
(Chapter: 1, 2, 3, 4)

UNIT - II: 15 Hours

Classes and Objects – Inheritance and Polymorphism – Interfaces and Packages-Applets.
(Chapter: 5, 6, 7, 8)

UNIT - III: 15 Hours

Abstract Windowing Toolkit-I – Abstract Windowing Toolkit-II-Swing-Exception Handling-Multi Threading.
(Chapter: 9, 10, 11, 12, 13)

UNIT - IV: 15 Hours

I/O Streams-Networking-java.lang.package-java.util.package.
(Chapter: 14, 15, 16, 17)

UNIT -V: 15 Hours

Java Database Connectivity-Servlets-Remote Method Invocation-Java Beans.
(Chapter: 18, 19, 20, 21)

TEXT BOOK

Programming with JAVA, C.Muthu, Tata McGraw Hill, 2nd Edition, 2011.

REFERENCES

1. The Complete Reference Java 2, Patrick Naughton, Herbert Schildt, Tata McGraw Hill, 5th Edition, 2006.
2. Java Programming, E. Balagurusamy, Tata McGraw Hill, 4th Edition, 2011.
3. Programming with Java, John R. Hubbard, Schaum Series, 2011

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.

SEMESTER IV

(CORE PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCPR41	PRACTICAL V PROGRAMMING IN JAVA LAB	1	CC11/ CC10	2

List of Practicals

1. Implementation of Classes and Objects
2. Implementation of Inheritance and Polymorphism
3. Implementation of Interface and Package concepts
4. Implementation of Flow, Border ,Grid Layouts
5. Implementation of Tic-Tac Toe Application Using Applets
6. Implementation of Frames, Menus, Dialog
7. Implementation of Swing concepts
8. Implementation of Exception Handling
9. Implementation of Multi Threading
10. Implementation of I/O Streams
11. Implementation of Java Networking concepts
12. Implementation of Java Servlets (Connecting Database)
13. Implementation of RMI
14. Implementation of Java Beans

SEMESTER IV
(ALLIED PHYSICS PAPER FOR COMPUTER SCIENCE ONLY)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAL41	ALLIED PHYSICS-II	6	CC12	7

Objective: This paper is offered to the students of Mathematics, Chemistry and Computer Science as Allied Subject. The logical reasoning behind the description of the physics problem and obtaining the solution to such problems are taught in this paper.

UNIT- I: Atomic physics (1 hour)

Atom model - vector Atom model- electron spin and spatial quantization - quantum numbers - Pauli's exclusion principle - excitation and ionization potentials- experimental determination-Frank and Hertz method.

UNIT- II: Nuclear Physics (2 hours)

Binding energy – BE/A Curve – mass defect - Particle Accelerator: Linear accelerator, cyclotron – Particle detector : GM counter – Transmutation – Types – Q value equation for a nuclear reaction – Types of nuclear reaction – Basic concepts of fission and fusion – Nuclear reactor – Harmful effects of nuclear radiation - Prevention.

UNIT- III: Electromagnetism and Transient current (1 hour)

Faraday's laws of electromagnetic induction - Lenz's law – Definition and Expression for self and mutual inductance -- Determination of coefficient of self inductance (Rayleigh's method) – Determination of co- efficient of mutual inductance Growth and Decay of current in LR circuit – Growth and Decay of charge in RC circuit.

UNIT- IV: Crystallography and Fiber Optics (1 hour)

Types of Solids - Crystalline and amorphous - Crystalline matter - Periodic Array of Atoms – Bravais lattice - unit cell - Miller indices – Bragg's law- Principle and

Derivation- Types of crystal structure – SC- FCC- BCC - co ordination number- atomic radius-Principle and propagation of light within the fiber - classification of optical fiber - fiber optic communication system block diagram.

UNIT- V: Electronics (2 hours)

Basic Electronics: Semiconductors – types - Junction Diode - I-V characteristic - LED – construction and working - Zener diode - voltage regulator - transistor - Characteristics of Transistor - common emitter mode.

Digital electronics: AND, OR, NOT gates - construction using diodes and transistors - NAND and NOR gates - Universal building Blocks. Boolean algebra - Demorgan's theorem – verification.

Books for study:

1. Allied Physics by Dr.R.Sabesan and Dr.Mrs.Dhanalakshmi
2. Allied Physics by Mr. Kamalakkannan and Jayraman.
3. Text book of optics by Brijal and Subramanian
4. Modern Physics by R. Murugesan S.Chand & Co.

Books for Reference:

1. Physics, 4th Edition, Vols I, II & II Extended by D.Halliday, R.Resnick and K.S.Krane,
Wiley, NY, 1994.
2. Digital Principles and Application - Malvino & Leach.
3. Basic Electronics, 6th Edition by B. Grob, McGraw- Hill, NY, 1989.

SEMESTER IV
(ALLIED PHYSICS PRACTICAL PAPER FOR COMPUTER SCIENCE ONLY)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAP41	ALLIED PHYSICS PRACTICAL-II	1	AEC4	2

Objective: It is aimed at exposing the Allied students to the technique of handling simple measuring instruments and also makes them measure certain mechanical and thermal properties of matter

List of Experiments (Any Eight experiments only)

1. Young's Modulus – Uniform bending method using Scale and Telescope.
2. Rigidity Modulus – Torsional oscillation method (with symmetric masses)
3. Specific heat capacity of a liquid – by Newton's law of cooling
4. Sonometer – Determination of AC frequency Using steel wire (Electromagnet)
5. Spectrometer Grating – Normal incidence – Wavelength of mercury spectral lines.
6. Potentiometer – calibration of low range ammeter.
7. Figure of merit –Current Sensitiveness and voltage sensitiveness of a galvanometer.
8. Construction of AND, OR gates using diodes and NOT by transistors.
9. Zener diode – Voltage Regulation.
10. Universal building block using NAND (IC 7400) only

Books for Reference

1. M.N. Srinivasan, S. Balasubramanian, R. Ranganathan, A Textbook of practical Physics, Sultan Chand & Sons
2. C.C Ouseph, G. Rangarajan, R. Balakrishnan- A Textbook of practical Physics- S. Viswanathan Publisher-PartII (1996)

Common to B.Sc., (S/W) / B.C.A.
SEMESTER IV
(ALLIED PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAL42	ALLIED FINANCIAL ACCOUNTING – II	6	CC12/ EC11	7

Objectives:

To inculcate basic accounting knowledge to Computer Science students

UNIT-I: 15 Hours

Average Due Date: Meaning – Practical uses of Average Due Date – Determination of Due Date – Basic Problems. (*Chapter I Sections 7.1;7.2.*)

UNIT -II: 15 Hours

Depreciation Accounting: Meaning of Depreciation – Causes of Depreciation - Methods of Providing Depreciation – Straight-Line Method – Diminishing Balance Method (Excluding Change in the Method of Depreciation) – Annuity Method. (*Chapter II Sections 11.1;11.2;11.4*)

UNIT -III: 15 Hours

Branch Accounts: Meaning – Types of Branches – Dependent Branches Debtors System – Stock and Debtors System – Final Accounts System– Distinction between Wholesale Profit and Retail Profit – Independent branches (Foreign branches excluded). (*Chapter III Sections 16.1;16.2;16.7;16.12*)

UNIT -IV: 15 Hours

Departmental Accounts: Meaning – Need – Distinction between Branches and Departments – Treatment of Joint Expenses –Apportionment of Expenses – Inter-Departmental Transfers at Cost Price – Inter-Departmental Transfer at Invoice Price – Treatment of Expenses which cannot be allocated. (*Chapter IV Sections 17.1-17.5*)

UNIT -V: 15 Hours

Hire Purchase System: Meaning and Legal Position – Accounting Aspects - Default and Repossession.

Installment Purchase System: Meaning and Legal position – Distinction between Hire Purchase System and Installment Purchase System- Accounting Treatment. (*Chapter V Sections.18.1-18.13*)

Total : 75 Hours

TEXT BOOK:

Financial Accounting, T.S. Reddy & A. Murthy, Margham Publications, 7th Edition, 2014.

REFERENCES:

1. Financial Accounting , R.L. Gupta & V.K. Gupta, Sultan Chand & Sons, 8th Edition, 2010.
3. Computer Applications in Business, S.R. Srinivasa Vallabhan, Sultan Chand & Sons, New Delhi.

SEMESTER IV
Common to B.Sc., (S/W) / B.C.A.
(ALLIED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5CCAP42	ALLIED PRACTICAL ACCOUNTS – LAB II	1/3	AEC4/ EC12	2/4

LIST OF EXERCISES

1. Cost Category & Cost Centre
2. Cost Category & Cost Centre using Class
3. Invoicing
4. Inventory & Stock.
5. Security Control
6. Bill of Material
7. Creation of Budget
8. Odoo / OpenERP
9. Financial Functions II in Excel.
10. Statistical Functions II in Excel

REFERENCE:

Lab Manual

SEMESTER IV
B.C.A.
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BC4002	ELECTRONIC COMMERCE	4	CC11	4

Objectives:

To provide the knowledge about commerce through electronic medium & information system.

UNIT I **15 Hours**

Electronic Commerce Framework, Traditional Vs. Electronic Business Application, The Anatomy of E-Commerce Applications. Network infrastructure for E-Commerce – Components of the I-way – Global Information Distribution Networks – Public policy issues shaping the I – way. Network Access Equipment

Chapter 1 : Section 1.1,1.2,1.3 & Chapter 2 : Section 2.2,2.3,2.5,2.6

UNIT II **15 Hours**

The internet as a Network Infrastructure, Network Security and Firewalls – Client Server Network Security – Firewalls and Network Security – Data and Message Security – Encrypted Documents and Electronic Mail. (*Chapter 3 : Section 3.1 to 3.7 & Chapter 5 : Section 5.1,5.3,5.4,5.6*)

UNIT III **15 Hours**

Electronic Commerce and World Wide Web, Consumer Oriented E-Commerce, Electronic Payment Systems (*Chapter 6 : Section 6.1,6.2, Chapter 7 : Section 7.1 & Chapter 8 : Section 8.1 to 8.6*)

UNIT IV **15 Hours,**

Electronic Data Interchange (EDI), EDI application in business, EDI and E-commerce –

EDI implementation. Intra-organizational Electronic Commerce - Supply Chain Management

Chapter 9 : Section 9.1,9.2,9.4 , Chapter 10 : Section 10.2, & Chapter 11 : Section 11.1,11.5

UNIT V **15 Hours**

Corporate Digital Library – Advertising and marketing on the Internet – E-Commerce Catalogs or Directories- On demand Education and Digital Copyright – Applets, Browsers & Software Agents.

Chapter 12 : Section 12.1 to 12.5, Chapter 13 : Section 13.1 to 13.3 , Chapter 14 : 14.3, Chapter 15 : Section 15.1,15.2,15.3 & Chapter 16: Section 16.6.

Total : 75 Hours

TEXTBOOK:

Frontiers of Electronic Commerce, R. Kalakota and Andrew. B. Whinston, Pearson , 11th Edition , 2011.

REFERENCES:

1. Understanding Electronic Commerce, Daid Kosiur, Microsoft Press, 1997.
2. From EDI to Electronic Commerce, Soka, McGraw Hill, 1995.
3. Electronic Commerce Management, Saily Chan, John Wiley, 1998.

SEMESTER IV
B.C.A.
(CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BC4003	PROBLEM SOLVING AND ALGORITHMS	4	CC12	4

Objectives:

The purpose of this course is to understand simple algorithms, language constructs and to develop problem solving skills

UNIT – I

15 Hours

Introduction to Computer Problem Solving: The Problem Solving Aspect- Top Down Design – Implementation of Algorithms – Program Verification – The Efficiency of Algorithms – The Analysis of Algorithms

Array Techniques: 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 Kth Smallest element. (*Chapter 1, Chapter 4: Sections 4.1 to 4.6*)

UNIT –II

15 Hours

Merging, Sorting & Searching: The Two Way Merge - Sorting by Selection – Sorting by Exchange – Sorting by Insertion – Binary Search. (*Chapter 5: Sections 5.1 to 5.4, 5.7*)

UNIT – III

15 Hours

Text Processing & Pattern Searching: 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 - IV

15 Hours

Dynamic Data Structure Algorithms: Stack Operations – Queue Addition and Deletion – Linked List Search – Linked Insertion and Deletion – Binary Search Tree – Binary Tree Insertion and Deletion. (*Chapter 7*)

UNIT – V

15 Hours

Recursive Algorithms: Binary Tree Traversal – Recursive Quick Sort – Towers of Hanoi Problem – Sample Generations – Combination Generation – Permutation Generation. (*Chapter 8*)

Total : 75 Hours

TEXT BOOK:

How to Solve it by Computer ,R.G. Dromey , Pearson Edition, 2012

B.C.A.
SEMESTER IV
(SKILL BASED PRACTICAL PAPER)

COURSE CODE	COURSE TITLE	CREDIT	COURSE NO	HRS/ WEEK
U5BCSBP4	PRACTICAL VI PROBLEM SOLVING AND ALGORITHMS LAB	2	AEC4	4

List of Lab Exercises:

1. Implementation of Merging, Sorting and Searching
2. Implementation of Stack and Queue Operations
3. Implementation of Linked List
4. Implementation of Binary Tree Search (Insertion & Deletion)
5. Implementation of Binary Tree Traversal
6. Implementation of Tower of Hanoi Problem

Reference:

Lab Manual

SYLLABUS
For
M.Sc. COMPUTER SCIENCE

SEMESTERS – I & II

(UNDER CBCS)

2016-2017

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CS1001	ADVANCED JAVA PROGRAMMING	5	6

OBJECTIVES:

The course covers several general-purpose topics: using and building generic types, writing multi-threaded applications, the Reflection API and annotations, and network programming using sockets. It combines with various other topics like JDBC, secure coding, Swing GUI programming, design patterns, and so on.

UNIT – I

5 Hours

Java utilities: collections - I/O Streams - Networking - Exception Handling.(Chapter 17,14,15,12)

UNIT _ II

7 Hours

AWT: Windows, Controls, Layout languages and Menus - Swing. Multi Threading - JDBC.(Chapter 9,10,11,30,18)

UNIT – III

9 Hours

Java Servlets: Design - Life Cycle - Constituents of javax.servlet package - cookies – session tracking –Java Language Packages.(Chapter 19,16)

UNIT - IV

9 Hours

Remote Method Invocation: Remote Interface - The Naming Class - RMI Security Manager Class - RMI Exceptions - Creating RMI Client and Server classes - RMI - I IOP. (Chapter 20)

UNIT - V

10 Hours

Java Beans: Events - Customization - Introspection - Persistence - EJB: Introduction – EJB Container - Classes - Interfaces - Deployment description - Session Bean - Entity Java Bean - Jar file.(Chapter 21)

TEXT/REFERENCE BOOKS

1. Muthu, Programming with Java, vijay Nicole Imprints private Ltd.,2004
2. Herbert Schildt, The complete Reference – JAVA 2 , Fourth Edition,2001
3. Deitel H.M. & Deital P.J, Java How To Program, Prentice-Hall of India, Fifth Edition, 2003.
4. Cay.S. Horstmann, Gary Cornel, Core Java 2 - Vol. II- Advanced Features, Pearson Education,2004.
5. Tom Valsky, Enterprise JavaBeans - Developing component based Distibuted Applications, Pearson 1999.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CS1002	ADVANCED SOFTWARE ENGINEERING	5	6

OBJECTIVES:

This course introduces the concepts and methods required for the construction of large software intensive systems. It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems.

UNIT - I: INTRODUCTION TO SOFTWARE ENGINEERING

10 Hours

Definition and size factors – Quality and productivity factors – Managerial issue- Planning a Software Project: Defining the problem – Developing a solution strategy – planning the development process – planning an organization structure – other planning activities (Chapter: 1 Section 1.1 to 1.4 , Chapter: 2 Section 2.1 to 2.5)

UNIT - II: SOFTWARE COST ESTIMATION

10 Hours

Software – Cost factors – Software cost estimation techniques – specification techniques – level estimation – estimating software maintenance costs. (Chapter: 3 Section 3.1 to 3.4)

UNIT - III: SOFTWARE REQUIREMENTS DEFINITION

8 Hours

The software requirements specification – formal languages and processors for requirements specification. (Chapter; 4 Section 4.1 to 4.3)

UNIT - IV: SOFTWARE DESIGN

10 Hours

Fundamental Design concepts – Modules and modularizing Criteria – Design Notations – Design Techniques – Detailed Design Consideration – Real time and distributed system design – Test plan – Mile stones walk through and inspection – Design guide lines (Chapter: 5 Section 5.1 to 5.9)

UNIT - V: SOFTWARE TESTING AND MAINTENANCE

10 Hours

Quality assurance – Static analysis – symbolic exception – Unit testing and Debugging – System testing – Integration testing-White box testing-Black box testing –Managua aspects of software maintenance – Configuration management – source code metrics – other maintenance tools and techniques. (Chapter: 8 Section 8.1 to 8.6, Chapter: 9 Section 9.2 to 9.5)

TEXT / REFERENCE BOOK

Total Hours:48

1. Software Engineering Concepts, Richard E. Fairly, McGraw-Hill book Company.
2. A concise introduction to software engineering –Pankaj Jalote- TMH ,2004.

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSPR11	PRACTICAL-I ADVANCED JAVA PROGRAMMING LAB	4	6

1. Servlets.
2. RMI
3. Sockets.
4. Create a simple java bean and demonstrate it using Bean Box.
5. Create a Java bean that demonstrates
 - a. Indexed Property.
 - b. Bound Property.
 - c. Constrained Property.
 - d. Event Handling and communication between two beans.
6. Write a Java program that demonstrates JDBC.
7. Write a Java program that demonstrates JSP.
8. Write a Java program that demonstrates different types of EJB.

REFERENCE BOOK:

- 1.LAB MANUAL

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSPR12	NETWORK PROGRAMMING LAB	4	6

1. Implement TCP and UDP Client-Server programs for following services:
 - a) Printing the Host ID, local port, also the client should indicate connection status
 - b) Echo Service c) Day Time Service d)Chargen Service
 - e)Mathematical Operation on numbers f)Checking number for prime, palindrome etc.
 - g)Calculating factorial h)Calculating Fibonacci series i)Case conversion in given string
2. Implement Client-Server programs for demonstrating working of Concurrent Connection Oriented Servers using single process.
3. Implement Client-Server programs for demonstrating working of Concurrent Connection Oriented Servers using multiple processes.
4. Implement Telnet Server program for providing different types of Telnet Services.
5. Demonstrate and implement the file transfer using FTP.
6. Develop the Chat Client and Server program. The Server should be concurrent such as to provide intercommunication between multiple clients.
7. Develop a simple web server capable of accepting request from standard client like IE, Netscape, Opera etc (use standard protocol HTTP).

REFERENCE BOOK:

- 1.LAB MANUAL

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSE101	THEORY OF COMPUTATION	4	6

OBJECTIVES:

To provide a study about Finite Automata and Non-Finite Automata, To understand regular expressions, context free grammars and languages and Realize some simple mathematical functions as turing machines

UNIT I : AUTOMATA

9 Hours

Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.(Chapter: 1 Section 1.2 to 1.4, Chapter: 2 Section 2.1 to 2.3, 2.5)

UNIT II : REGULAR EXPRESSIONS AND LANGUAGES

9 Hours

Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.(Chapter: 3 Section 3.1 to 3.2, Chapter: 4 Section 4.1 to 4.2, 4.4)

UNIT III : CONTEXT-FREE GRAMMARS AND LANGUAGE

9 Hours

Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.(Chapter: 5 Section 5.1 to 5.2, 5.4, Chapter: 6 Section 6.1 to 6.4)

UNIT IV : PROPERTIES OF CONTEXT-FREE LANGUAGES

9 Hours

Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.(Chapter: 7 Section 7.1 to 7.3, Chapter: 8 Section 8.2 to 8.3)

UNIT V : UNDECIDABILITY

9 Hours

A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Post's Correspondence Problem – The classes P and NP.(Chapter: 9 Section: 9.1 to 9.4, Chapter: 10 Section 10.1)

TEXT / REFERENCE BOOKS

Total Hours:45

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory, Languages and Computations", second Edition, Pearson Education, 2007.

2. Thomas A. Sudkamp, "An Introduction to the Theory of Computer Science, Languages and Machines", Third Edition, Pearson Education, 2007.
3. Raymond Greenlaw and H. James Hoover, "Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.
4. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.
5. Michael Sipser, "Introduction of the Theory and Computation", Thomson Brooks/Cole, 1997.
6. J. Martin, "Introduction to Languages and the Theory of computation" Third Edition, Tata Mc Graw Hill, 2007

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSE102	PRINCIPLE OF PROGRAMMING LANGUAGES	4	6

OBJECTIVES:

To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT I: INTRODUCTION

The role of programming languages, Language Description: Syntactic Structure

UNIT II: IMPERATIVE PROGRAMMING

Statements-Structured Programming, Types: Data Representation-Procedure Activations

UNIT III: OBJECT ORIENTED PROGRAMMING

Groupings of data and operations, Object oriented Programming

UNIT IV: FUNCTIONAL PROGRAMMING

Elements of Functional programming-Functional programming in a typed language, Functional programming with Lists

UNIT V: OTHER PARADIGMS

Logic programming-An introduction to concurrent programming: Language Descriptions-Semantic Methods, static types and the Lamda Calculus

TEXT BOOK

1. Ravi Sethi, “ Programming Languages: Concepts and Constructs”, 2nd Edition, Pearson Education , 2006.

REFERENCES

1. Terrence W. Pratt and Marvin V. Zelkowitz, “Programming Language Design and Implementation”, 4th Edition, Prentice Hall of India, 2005.
2. Peter Van Roy and Seif Haridi, “Concepts, Techniques and Models of Computer Programming, Prentice Hall of India, 2004.

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CS2001	DESIGN AND ANALYSIS OF ALGORITHMS	5	5

OBJECTIVES:

To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT I : DIVIDE AND CONQUER METHOD

8 Hours

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Heap sort, Strassen's matrix multiplication (Chapter 3: Section 3.1, 3.2, 3.4, 3.5, 3.7)

UNIT II : GREEDY METHOD

10 Hours

Greedy method: Single source shortest path problem-Knapsack problem-Flow shop scheduling- Minimum spanning trees-. Search techniques-Code optimization, Depth first search, breadth first search. (Chapter 4: Section 4.1, 4.2, 4.5, 4.8, Chapter 5: Section 5.10, Chapter 6: Section 6.1, 6.2)

UNIT III : DYNAMIC PROGRAMMING

10 Hours

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, All pairs shortest path problem-0/1 knapsack problem-Travelling sales person problem. (Chapter 5: Section 5.1, 5.3, 5.5, 5.7, 5.9)

UNIT IV : BACKTRACKING

10 Hours

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. Branch and Bound: General method, applications - Travelling sales person problem. (Chapter 7: Section 7.1 to 7.5, Chapter 8: Section 8.1, 8.3)

UNIT V : NP-COMPLETENESS

10 Hours

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem. (Chapter 11: Section 11.1, 11.2)

TEXT / REFERENCEBOOKS :

TotalHours:48

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.
3. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHI Pvt. Ltd./ Pearson Education.

II SEMESTER (CORE PAPER)

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CS2002	MOBILE COMPUTING	5	6

OBJECTIVES :

To understand the concept of mobile communication and various issues related with mobile networks and WCDMA technology

UNIT - I

Intoduction: Advantages of Digital Information - Intoduction to Telephone Systems – Mobile communication: Need for Mobile Communication - Requirements of Mobile Communication - History of Mobile Communication.(Chapter 1:1.1,Chapter 2,Chapter 3:3.1 to 3.3)

UNIT - II

Intoduction to Cellular Mobile Communication - Mobile Communication Standards - Mobility Management - Frequency Management - Cordless Mobile Communication Systems.(Chapter 4 to 8)

UNIT - III

Mobile Computing: History of data networks - Classification of Mobile data networks – CDPD System - Satellites in Mobile Communication: Satellite classification - Global Satellite Communication - Changeover from one satellite to other - Global Mobile Communication - Interferences in Cellular Mobile Communication.(Chapter 9:9.1 to 9.3,Chapter 10:10.1 to 10.3,Chapter 11,12)

UNIT - IV

Important Parameters of Mobile Communication System - Mobile Internet: Working of Mobile IP - Wireless Network Security - Wireless Local Loop Architecture: Components in WLL - Problems in WLL - Modern Wireless Local Loop - Local Multipoint Distribution Service - Wireless Application protocol.(Chapter13,14:14.1,Chapter 15,16:16.1 to 16.4,Chapter 17)

UNIT - V

WCDMA Technology and Fibre Optic Microcellular Mobile Communication - Ad hoc Network and Bluetooth technology - Intelligent Mobile Communication system - Fourth Generation Mobile Communication systems.(Chapter 18 to 21)

TEXT BOOK:

1. T'G. Palanivelu, R. Nakkeeran, Wireless and Mobile Communication, PHI Learning Private Limited.2009

**II SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSPR21	PRACTICAL III-OPEN SOURCE PROGRAMMING LAB	4	6

1. Develop a PHP program using controls and functions
2. Develop a PHP program and check message passing mechanism between pages.
3. Develop a PHP program using String function and Arrays.
4. Develop a PHP program to display student information using MYSQL table.
5. Develop a college application form using MYSQL table.
6. Develop a PHP program using parsing functions (use Tokenizing)
7. Develop a PHP program and check Regular Expression- HTML functions- Hashing functions.
8. Develop a PHP program and check File System functions- Network functions- Date and time functions.
9. Develop a PHP program using session.
10. Develop a PHP program using cookie and session.

REFERENCE BOOK:

- 1.LAB MANUAL

**I SEMESTER
(CORE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSPR22	PRACTICAL IV- MOBILE APPLICATION DEVELOPMENT LAB	4	5

1. EditText-Button-OnClickListener-Counter
2. Edittext-RadioGroup-OncheckChangeListener-Discount Calculator
3. Background-SetColor-RadioButton-Coloring
4. Intent-MediaPlayer-Thread-Splash Screen with sound
5. SeekBar-OnSeekbarchangeListener-Coloring Layout
6. TabWidget-onInitListener-Talking Clock
7. ListView-onItemClick/onItemLongclick/AlertDialog
8. GridView-ImageView-BaseAdapter-SetLayout
9. Reading/Writing file in SDCard
10. Menu Inflate

REFERENCE BOOK:

- 1.LAB MANUAL

**I SEMESTER
(CORE BASED ELECTIVE PAPER)**

COURSE CODE	COURSE TITLE	CREDIT	HRS/ WEEK
P6CSE201	FUZZY AND NEURAL NETWORKS	4	6

OBJECTIVES:

This course provides the details and structure of biological and artificial neuron and the applications of artificial neural networks- including the fuzzy systems and fuzzy logic controls.

UNIT-I: ARCHITECTURES

10 Hours

Introduction – Biological neuron – Artificial neuron – Neuron modeling – Learning rules – Single layer – Multi layer feed forward network – Back propagation – Rule based Neural Network.(Chapter 1: 1.3,Chapter 2:2.1 to 2.4,Chapter 3:3.5,Chapter 4:4.2)

UNIT-II: NEURAL NETWORKS FOR CONTROL

10 Hours

Expert Systems Heuristics– Discrete time hop field networks –Supervised and Unsupervised Learning – Applications of artificial neural network – Self Organization Models– Fuzzy Logic and Neural Network (Chapter 2:2.5,2.6,2.7 Chapter 3:3.2,Chapter 6:6.3,Chapter 7:7.2,Chapter 11:11.7,11.7.1)

UNIT-III: FUZZY SYSTEMS

8 Hours

Classical sets – Fuzzy sets – Fuzzy relations – Fuzzification – Defuzzification – Fuzzy rules.(Chapter 3:3.1 to 3.4)

UNIT-IV: FUZZY LOGIC CONTROL

10 Hours

Membership function – Knowledge base – Decision-making logic – Optimization of membership function using neural networks – Adaptive Networks – Hybrid Learning Rules (Chapter 2:2.1 to 2.4,Chapter 8:8.1 to 8.5)

UNIT-V: APPLICATION OF FLC

10 Hours

Fuzzy logic control – Inverse Learning–ANFIS Applications –Auto mobile MPG Prediction-Channel Equalization– Introduction to neuro fuzzy controller.(Chapter 17:17.1 to 17.4,Chapter 19:19.1 to 19.6)

TEXT BOOKS

Total Hours: 48

- 1.Neuro Fuzzy And Soft Computing – J.S.R. Jang, C.T. Sun,E. Mizutani – PHI Learning 2014 (Unit III to Unit V)
- 2.Neural Networks in Computer Intelligence – LiMin Fu – Tata McGraw-Hill Edition 2011 (Unit I and Unit II)

REFERENCE BOOKS

3. Laurance Fausett- Englewood cliffs- N.J.- 'Fundamentals of Neural Networks'- Pearson Education- 1992.
4. H.J. Zimmermann- 'Fuzzy Set Theory & its Applications'- Allied Publication Ltd.- 1996.
5. Simon Haykin- 'Neural Networks'- Pearson Education- 2003.
6. John Yen & Reza Langari- 'Fuzzy Logic – Intelligence Control & Information'- Pearson Education- New Delhi- 2003.