ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI – 635 752

(AIDED & SELF FINANCE)

SYLLABI BOOK- IV

5th Academic Council

02nd March 2014

ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI -2

UG - FOUNDATION COURSE

URDU PAPER – III (SEMESTER III)
SYLLABUS FOR ALL UG II YEAR FROM 2014 – 2015 ONWARDS

PAPER III   ..   PROSE, HISTORY OF URDU LITERATURE
                    & GENERAL ESSAYS

UNIT – I   PROSE:
             BOOK PRESCRIBED: FAIZAN-E-ADAB , APPLIED BOOKS,
NEW DELHI

1. QISSA-E-HATIM TAI   --- Meer Amman Dehlavi
2. SIR SYED MARHOOM AUR URDU LITERATURE …   Moulana Shibli
Noumani
3. NOOR JAHAN … Mohammed Hussain Azad
4. KHANWADA-E-WALAJAHI KA EK GUMNAM SAH'ER-NAWAB
MAHMOOD…
   Dr. Syed Sajjad Husain
5. MARHOOM KI YAAD MEIN … Putars Bukhari

UNIT II- HISTORY OF URDU LITERATURE:

  URDU ZUBAN KI IBTIDA AUR USKA IRTIQA, URDU KI IBTIDA
  KE BARE ME,
  MUKTALIF NAZARIAT, MEER, GHALIB, MOMIN, IQBAL, FAIZ,
  SIR SYED AHMED KHAN, HALI, PREM CHAND, KRISHAN CHANDER

UNIT III- GENERAL ESSAYS:

Book for reference:
Guldasta-e-Mazameen-o-Insha Pardazi by Md. Arif khan,
Published by Educational Book House, Aligarh
                         ………………………..

ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI -2

UG - FOUNDATION COURSE

URDU PAPER - IV (SEMESTER IV)
SYLLABUS FOR ALL UG II YEAR FROM 2014 – 2015 ONWARDS

PAPER IV   ..   NON-DETAILED TEXT (SHORT-STORIES),
DRAMA &URDU DTP

UNIT - I   Non-detailed Text (Short-stories)
        BOOK PRESCRIBED: FAIZAN-E-ADAB , APPLIED BOOKS, NEW
DELHI

1. KAFAN   --   Munshi Prem chand
2. NOOR O NAAR   --   Ali Abbas Hussaini
3. JAMUN KA PED   --   Krishan Chandar
4. KHUSH NASEEB   --   Ali Akbar Amburi
5. SAMJHOTA   --   Aabid Safi
6. BARF GUZEDA LOG--   Akbar Zahid
7. DIL-E-NADAAN   --   Ameerunnisa
8. AATH WAN PANKHA-   Shubaib Ahmed Kaaf
9. RAHMAN KE JOTEY --   Rajinder Singh Bedi
10. PANKHADIYAN GULAB KI - Rasheed Madrasi

UNIT II – DRAMA:

   DARWAZ-E-KHOL DO --- BY KRISHAN CHANDER
   Published by : Maktaba Jamia Ltd. Jamia Nagar, NEW DELHI.. 110 032

UNIT III – URDU DTP:

 In page software both theory & practical
Books Prescribed:
    1. Urdu Software published by National Council for Promotion of Urdu
       Language, New Delhi
    2. Urdu DTP published By National Council for Promotion of Urdu Language,
       New Delhi

UG-FOUNDATION COURSE IN ARABIC

SEMESTER III

ARABIC PAPER III

FOR ALL UG 2ND B.A & BSc only

From 2014-2015 onwards

PAPER III:PROSE &ESSAY IN ARABIC

BOOK PRESCRIBED: PROSE:-

Durus-al-lughat-al-arabiyya lighair al natigina biha lesson(01 to 16 only)

By Dr.V.Abdur Rahim

Essay in Arabic

10 selected Essay in Arabic on the following topics only.

1. AL AKHAWANIL MUTAHABAANI.
2. ARRAFEEQUL JABAN
3. KARAMU AL SAYEEDATU AIYSHA(RZ)
4. BIMUN SADIQATUN
5. AL WALADUL AMEEN
6. SAKHAU SAIDINA USMAN(RZ)
7. SAYEEDUL KHAUMI KHADIMUHUM
8. JAZAUL AMANAH
9. KARAMU HATIM TAYEE
10. MINM MAKARIM AKHLAQI RRASOOL(SAL)

Book: Nafhatul Adab

By

Mohammed Waheeduzzaman Keravvi

UG-FOUNDATION COURSE IN ARABIC

SEMESTER IV

ARABIC PAPER IV

FOR ALL UG 2ND B.A & BSc only

From 2014-2015 onwards

PAPER IV PROSE &ESSAY IN ARABIC

BOOK PRESCRIBED: PROSE:-

Durus-al-lughat-al-arabiyya lighair al natigina biha lesson(17 to 31 only)

By Dr.V.Abdur Rahim

Essay in Arabic

10 selected Essay in Arabic on the following topics only.

1.SHAJAATU HAMZATUBNI ABDUL HUTTALLIB

2.GHAFLATUL KHADIMI

3.UMER BIN ABDIL AZEEZ

4.JAZAUL IHSAAN

5.ADALU UMER IBNILKHATTAB

6.ATTAUN BAIN A'AMA WA KASEEH

7.JAZAUL KHAYANAH

8.AMMASAAILA FALATANAAR

9.ABDULLA BIN JAFER WALGHULAM

Book: Nafhatul Adab   By   Mohammed Waheeduzzaman Keravvi

ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI
THIRD SEMESTER – HINDI PAPER – III

SYLLABUS AND BOOKS PRESCRIBED :

I. MEDIEVAL POETRY :   1.KABIR – DOHE   1 – 8 *only*
                        2. SURDAS – PAD   1 – 4 *only*
                        3. MEERABAI - PAD   1 & 2 *only*
                        4. TULSIDAS - DOHE   1 – 8 *only*
                        5. RAHIM – DOHE   1 – 8 *only*
                        6. BIHARI – DOHE   1 – 8 *only*

TEXT : RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN,
      ALLAHABAD

II. DRAMA : ANDHER NAGARI *by* BHARATENDU HARISCHANDRA
         LOKBHARATHI PRAKASHAN
         ALLAHABAD.

III. IDIOMS AND PROVERBS : MEANINGS ONLY(PRESCRIBED
                       IDIOMS AND PROVERBS ENCLOSED)

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)

REF 1. VYAVAHARIK HINDI VYAKARAN by Dr.HARDEV BAHRI.
                LOKBHARATHI PRAKASHAN
                ALLAHABAD.
     2. HINDI SHABDA SAMARTHYA by PRABHATH PRAKASHAN
                NEW DELHI.

V. HISTORY OF HINDI LITERATURE : GENERAL INFORMATION
                  ABOUT THE PRESCRIBED POETS
                  BELONG TO FIRST THREE PERIODS
  1.CHAND BARDAI 2. VIDYAPATHI 3. AMEER KHUSRO
  4. JAYASI 5. NANDADAS 6. KESHAV DAS 7. GHANANAD &
  8. DEV *only*

REF : 1. HINDI SAHITYA KA ITHIHAS, RAMCHANDRA
        SHUKLA,KARVI PRAKASHAN, JAIPUR.
       1.   HINDI SAHITYA KA ITHIHAS, DR. NAGENDRA, NATIONAL
         PUBLISHING HOUSE, NEW DELHI.

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FOURTH SEMESTER – HINDI PAPER – IV

SYLLABUS AND BOOKS PRESCRIBED :

I.MODERN POETRY :   1.YASHODHARA KA ANUTHAP *by*
                         MYTHILISHARAN GUPTA
                      2. JAAGO JEEVAN KE PRABHAT *by*
                         JAYSHANKAR PRASAD
                      3. ABHI NA HOGA MERA ANTH *by*
                         NIRALA.
                      4. SUKH - DUKH *by* PANTH
                      5. VE MUSKATE PHOOL NAHI *by*
                         MAHADEVI VARMA
                      6. TOOTA PAHIYA *by* DHARMAVEER
                         BHARATHI
 TEXT : RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN,
     ALLAHABAD
II.(a) APPLIED GRAMMAR : 1. CORRECTION OF SENTENCES.
                         2. PAIR WORDS.(JODI KE SHABD)
  REFERENCE BOOKS : 1. VYAVAHARIK HINDI VYAKARAN
                     by Dr.HARDEV BAHRI.
                     LOKBHARATHI PRAKASHAN
                     ALLAHABAD.
                   2. RACHNA RASHMI 1 & 2 ,VINOD
                     PUSTAK MANDIR, AGRA.
 (b) HINDI LANGUAGE : TATSAM, TATBHAV, DESHAJ, VIDESHI
     WORDS.(ref: HINDI BHASHA AUR NAGARI LIPI,
     BHOLANATH TIWARI, LOKBHARATI, ALLAHABAD)
III. HISTORY OF HINDI LITERATURE : GENERAL INFORMATION
     ABOUT THE PRESCRIBED POETS/WRITERS FROM MODERN
     PERIOD. 1. AGNEYA 2. SREELAL SHUKLA
      3. NAGARJUN. 4. DINKAR 5. MANNU BHANDARI.
      6. JAGDISH GUPTA 7. DHOOMIL 8. BACHCHAN.
IV. COMPUTER / INTERNET TERMINOLOGY – PRESCRIBED
                  TERMS FROM ENGLISH TO HINDI.
V .TRANSLATION : SENTENCES FROM ENGLISH TO HINDI.

   PRESCRIBED LESSONS : 16, 17, 18, 19 *only.*
   BOOK PRESCRIBED : ANUVAD ABHYAS – I
   D.B.HINDI PRACHAR SABHA, CHENNAI – 17.

இசுலாமியாக் கல்லூரி (தன்னாட்சி)
வாணியம்பாடி-1.
தமிழ்-அடித்தளப்படிப்பு
இரண்டாமாண்டு - மூன்றாம் பருவம்   2014-2017
பாடக்குறியீடு:UOFTA 301

பொருளடக்கம்

இசுலாமியாக் கல்லூரி(தன்னாட்சி)
வாணியம்பாடி-1.
அடிப்படைத்தமிழ்-இரண்டாமாண்டு - மூன்றாம் பருவம்
2014-2017
பாடக்குறியீடு:UONMBT31

பொருளடக்கம்

அலகு-1   தமிழ் இலக்கணம் அறிமுகம்
எழுத்து-சொல்-பொருள்-யாப்பு-அணி
எழுத்தின் வகைகள்-உயிர் எழுத்து,மெய்யெழுத்து,
உயிர்மெய் எழுத்து,ஆய்த
எழுத்து,குறில்,நெடில்,சார்பெழுத்துகள்
போலி-மூன்று வகைபோலி அறிமுகம் செய்தல்
(முதல்,இடை,கடை)
மயங்கொலி சொற்கள்-அனை-அணை,மறம்-மரம்

அலகு-2

சொல்அறிமுகம்
பெயர்ச்சொல்,வினைச்சொல்,இடைச்சொல்,உரிச்சொல்

பால் அறிமுகம்
ஆண்பால் பெயர்,பெண்பால் பெயர்,பலர்பால்
பெயர்,ஒன்றன்பால் பெயர்,பலவின்பால் பெயர்
ஒருமை-பன்மை

அலகு-3   மூவிடப் பெயர்கள்-தன்மை-முன்னிலை-படர்க்கை
வினா-அறிவினா-அறியா   வினா-ஐயவினா-
கொளல்வினா-ஏவல் வினா-கொடை வினா

அலகு-4   வாக்கிய மாற்றம்
செய்வினை-செயப்பாட்டு   வினை-செய்தி   வாக்கியம்-
உணர்ச்சி   வாக்கியம்-கட்டளை   வாக்கியம்-வினா
வாக்கியம்

அலகு-5   பலபொருள் குறித்த ஒரு சொல்
ஒரு பொருள் குறிக்கும் பல சொற்கள்

இசுலாமியாக் கல்லூரி (தன்னாட்சி)
வாணியம்பாடி-1.
தமிழ்-அடித்தளப்படிப்பு
இரண்டாமாண்டு - நான்காம் பருவம்
2014-2017
பாடக்குறியீடு:UOFTA 401
பொருளடக்கம்

| அலகு-1 | நவீனக் கவிதைகள் |
| | |

1.கா.அப்துல் கதூர்   -பூச்செண்டு
2.கவிக்கோ   -சிறகுகள்
3.ஈரோடு தமிழன்பன்   -பறந்துபோ-
                             -பறந்து கொண்டே
                             உரையாடு பறவையோடு
4. வா.மு.சே.ஆண்டவர்   -வெங்காயம்
5.தமிழச்சி தங்கபாண்டியன்   -எஞ்சொட்டுப்பெண்
6.மனுஷ்யபுத்திரன்   -தமிழ் வாழ்க்கை
7.குட்டி ரேவதி   -முள்ளிவாய்க்கால்

| அலகு-2 | சிறுகதைகள் |
| | |

1.புதுமைப்பித்தன்-அகல்யை
2.சுப்ரபாரதிமணியன்-குப்பை உலகம்
3.ஹ.மு.நத்தர்சா- பெத்த மனசு

| அலகு-3 | இதழியல்,நாட்டுப்புறவியல் |
| | |

1.இதழியல் -ஓர் அறிமுகம்
2.நாட்டார் வழக்காற்றியல் -ஓர் அறிமுகம்

| அலகு-4 | தமிழ் இலக்கணம்,செயல்திறன் பயிற்சி |
| | |

பொதுஅறிவு,தமிழ்இலக்கணம்,ஆட்சிமொழி,
விண்ணப்பம்
நேர்காணல்,வாடிக்கையாளர் சேவை
சுற்றுலா வழிகாட்டி கடிதங்கள்

அலகு-5	மொழிபெயர்ப்பு,கணினித்தமிழ்,
	இணையதளம்,கணிப்பொறி வலைப்பூ
	Lan-Vanஇணையம்,இணையதள
	முகவரிகள்,மின்னிதழ்கள்

இசுலாமியாக் கல்லூரி(தன்னாட்சி)
வாணியம்பாடி-1.
அடிப்படைத்தமிழ்-இரண்டாமாண்டு - நான்காம் பருவம்
2014-2017
பாடக்குறியீடு:UONMBT41

பொருளடக்கம்

DEPARTMENT OF ENGLISH
PART II   ENGLISH   PAPER III
SYLLABUS FOR SEMESTER-III

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

UNIT-IV

GRAMMAR

1. SUBJECT AND PREDICATE
2. DEGREES OF COMPARISION
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, EVERTHING IS LOST

TEXT BOOK:

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

UNIT-I

SHORT STORIES
1. SWEETS FOR ANGELS
   R.K. Narayan
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

UNIT-IV

GRAMMAR
1. ACTIVE AND PASSIVE VOICE:
   TENSES AND AGREEMENT
   VERB WITH TWO OBJECTS
   USE OF 'IT'.
2. DIRECT AND INDIRECT SPEECH:
   POSITIVE AND NEGATIVE STATEMENT
   AND QUESTIONS
3. MODALS:
   POSITIVE AND NEGATIVE QUESTIONS
4. 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
   1. THINGS TO CARRY FOR THE INTERVIEW
   2. FREQUENTLY ASKED QUESTIONS

TEXT BOOK:

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

ISLAMIAH COLLEGE [AUTONOMOUS]　　　　B.A. HISTORY

VANIYAMBADI　　　　　　　　　　　　III SEMESTER

CORE PAPER V

HISTORY OF INDIA FROM 1707 TO 1885 AD

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 Recommended

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.

HISTORY OF TAMILNADU FROM 1806 TO 2006 AD

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 Reference
1. Balaji B.S.: Studies in Madras Administration 2 Vols
2. Balasundram N.: "The Dravidian Movement in Madras" in state politics in India.
3. Beaglebole T.H.: Thomas Munroe and the development of administrative policy in Madras.
4. Devanandam. P.D: The Dravida kazhagam. A Revolt Against Brahmins.
5. Hardgrave L. Robert: The Dravidian movement – Popular Prakasam, Bombay.

TOURISM IN SOUTH INDIA (EXCLUDING TAMIL NADU)

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 Reference

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

3. Dominique Sila Khan, Sacred Kerala, A Spiritual Pilgrimage, Penguin Books India Pvt., Ltd., Chennai

4. Karnataka Tourist Map, Stark World Team, Stark World, Bengaluru, 2008

GENERAL KNOWLEDGE AND AWARENESS

UNIT I

Politics: Elections – Political parties – Constitution – Power of Constitutional Authorities – Rajya Sabha – Lok Sabha – States and Union Territories – State Legislature – Judiciary

UNIT II

Subject Knowledge: General Knowledge – History – Geography – Civics – Economics – Sociology – Literature – Religions – Science Subjects

UNIT III

Indian Tourism: Monuments – National Parks – Wild Life Sanctuaries – Hill Stations– Waterfalls – Other Tourist Destinations

UNIT IV

Current Affairs: India since Independence – Developments since World War II – Awards and Honors in Civil, Military and Sports

UNIT V

Cultural Academies at Centre and State Levels – Educational, Scientific and Research Organizations of Repute – Fine Arts: Dances, Music, Painting, Folk Arts

Books for Reference:

1. Competition Success Review – year Book

2. Competition Success Review – Fortnightly

3. Manorama Year Book

4. Chronicle Year Book

5. Upkar's General knowledge – Year Book

ISLAMIAH COLLEGE [AUTONOMOUS]   **B.A.HISTORY**

VANIYAMBADI   **III SEMESTER**

NON MAJOR

INDIAN NATIONAL MOVEMENT

UNIT I

Early Nationalist response: Causes, course, nature and impact of the Revolt of 1857 – Peasant, Tribal and Religious Movements – Political Associations in Bengal, Bombay and Madras before Indian National Congress

UNIT II

Institutionalisation of the National Movement: Factors responsible for the formation of the Indian National Congress – Origin of the Congress – Moderate Phase (1885-1905) – their nature, ideology, politics and leaders – Minto-Morley Reforms

UNIT III

Extremist Phase (1905-1916): Partition of Bengal – Surat Split – Swadeshi and Boycott Movement – Lucknow Pact – Montague-Chelmsford Reforms

UNIT IV

Emergence of Gandhiji: Rowlatt Act – Satyagraha – Jalianwalabagh Massacre – Khilafat and Non-Cooperation Movement – Swarajya Party – Simon Commission – Nehru Report – Civil Disobedience Movement – Round Table Confrerences – Govt. of India Act 1935 – Concept of Pakistan

UNIT V

Final Phase: Provincial Governments – Lahore Resolution – Cripps Mission – Quit India Movement – Cabinet Mission – Mountbatten Plan – Partition – Independence

Books for Reference

1. Tara Chand : History of Freedom Movement Vol. I - IV, Publications Division, Govt. of India, 1983.

2. Sumit Sarkar: Modern India, 1885 - 1947, MacMillan India Ltd, Madras, 1986.

3. Bipin Chandra and Others: India's Struggle for Independence, Penguin Books, 1990.

ISLAMIAH COLLEGE [AUTONOMOUS]   **B.A HISTORY**

VANIYAMBADI   **IV SEMESTER**

CORE PAPER VII

HISTORY OF INDIA FROM 1885 TO 2000 AD

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 Comission – 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 Reference

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.

ISLAMIAH COLLEGE [AUTONOMOUS]   **B.A. HISTORY**

VANIYAMBADI   **IV SEMESTER**

CORE PAPER VIII

HISTORY OF THE DRAVIDIAN MOVEMENT

UNIT I

Dravida Kazhagam: Emergence, Leaders, Ideology and Impact – Periyar, His Thought and Contribution

UNIT II

Dravida Munnetra Kazhagam: Foundation – C.N. Annadurai and His Followers – Emergence of DMK as a Political Party and its participation in Elections – Anti-Hindi Agitation and its Impact on Tamil Nadu Politics

UNIT III

All India Anna Dravida Munnetra Kazhagam: Split with DMK – M. G. Ramachandran –

J. Jayalalithaa

UNIT IV

Welfare Measures of DMK and AIADMK – Alliance Politics and Participation in Central Government and Puducherry

UNIT V

Challenges and Responses of Dravidian Parties to Various Issues: Sri Lankan Tamil Issue – Water Disputes with Neighbouring States – Kachativu Island Issue – Fishermen Issues – Sethu Samudram

Books for Reference
1. Balasundaram, N- The Dravidian Movement in Madras
2. Devanandan. P.D-The Dravida Kazhagam A revolt against Brahmins
3. Irschick Eugene.F-Tamil Revivalism in the 1930's
4. Hardgave L. Robert-The Dravidian Movement
5. Ramamoorthy. P-The Freedom Struggle of the Dravidian Movement
7. Grilbert Stater-Dravidian Elements in Indian culture

ISLAMIAH COLLEGE (AUTONOMOUS) **B.A. HISTORY**

VANIYAMBADI **IVSEMESTER**

ALLIED PAPER IV

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 Reference

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

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

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

CIVIL SERVICES AND OTHER COMPETITIVE EXAMINATIONS

UNIT I

Competitive Examinations in India: Introduction – Civil Services – Preliminary and Main Examinations – Government Employment in Other Services – Examination Patterns

UNIT II

Central Services: Union Public Service Commission – Railway Recruitment Board – Defence Examinations – LIC / GIC Examinations – Staff Selection Commission Examinations – UGC / NET Examinations – Bank Examinations

UNIT III

TNPSC: Tamil Nadu Public Services Examinations – Combined Civil Services Examinations, Group I – Combined Civil Services Examinations, Group II (Interview Posts) – Madras High Court Service Examinations – District Educational Officers Examinations – Village Administrative Officers Examinations – Other Technical Examinations

UNIT IV

 Subjects of Study for TNPSC Examinations Group I: – Mathematics – Physics – Chemistry – Biology – Zoology – History – Sociology – Computer Science

TNPSC Group II, III and IV: General Knowledge – Politics – History – Current Affairs – National Movement – Science – Geography – Economics and Business – Intelligent Quotient –General Tamil – Perusing Previous Years Question Papers

UNIT V

Competitive Examination Preparation Tips: Motivation – Active Learner – Organizing Studies – Time Management – Reading Newspapers, Magazines, Subject and

Reference Books – Writing Examinations at Home – Good Handwriting Practice – Avoiding Stress – Perusing Previous Years Question Papers

Books for Reference

1. Dr. Divya S Iyer, Path Finder: Civil Services Main Examination, DC Books Pvt Ltd, New Delhi
2. Edgar Thorpe, The Pearson CSAT Manual 2013: Civil Services Aptitude Test for the UPSC   Civil Services Preliminary Examination, New Delhi
3. S.A. Majid, Special Current Affairs for Civil Services Examination, Kalinjar Publications,   New Delhi
4. Sanjiv Verma, The Indian Economy : For UPSC and State Civil Services Preliminary and   Main Examinations, Unique Publications, New Delhi
5. Veerasekaran, TNPSC Group II, Kizhakku Publishers, Chennai
6. Veerasekaran, TNPSC Group III, Kizhakku Publishers, Chennai

ISLAMIAH COLLEGE (AUTONOMOUS)   **B.A. HISTORY**

VANIYAMBADI   **IV SEMESTER**

NON-MAJOR

INDIAN POLITICAL SYSTEM FROM 1885 TO 2010 AD

UNIT I

Introduction - Indian National Congress – Minto-Morley Reforms – Montague-Chelmsford Reforms – Government of India Act 1935

UNIT II

Constituent Assembly and drafting of the Indian Constitution – Salient Features of the Indian Constitution

UNIT III

Political Institutions – Union and State Executives – Union and state Legislature – Uni-Cameral and Bi-Cameral legislature and Judiciary

UNIT IV

Political System – Multi Party System – Pressure Groups – Universal Adult Franchise – Political Parties – INC, Muslim League, CPI, BJP, SP, BSP, DMK and AIADMK

UNIT V

Election Commission- Election Commission of India – Powers &functions – State Election Commission – Powers and functions

Books for Reference

1. Indian Political System- J.C. Johari

2. Modern Indian Political System: Problems and Prospects - B.K.Verma

3. Modern Indian Political System- David Eugene Wilkins

4. Indian Political System-Approaches to Indian Politics - Virender Grover

5. Indian Political System: Trends and Challenges-Volume 10 - Virender Grover

6. Constitutional Development and National Movement of India – R.C. Agarwal

<div align="center">**CORE PAPER V**</div>

<div align="center">**PRODUCTION MANAGEMENT**</div>

UNIT I

Production — production management - production system – productivity – objectives of production management – Functions and scope of production management – 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 – Maintenance Scheduling.

UNIT III

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

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

UNIT IV

Work and Method Study – importance of work study – Work Study procedures – Time study — Objectives of method study – Steps involved in method study.

Work measurement - Objectives of work measurement – Techniques of work measurement.

UNIT V

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

Text Books:

1. Saravanavel P and Sumathi S - Production and Materials Management.
2. Chunnawalla and Patel - Production and Materials Management.
3. Muhelmann Production and Operation Management MacMillan I Ltd.
4. Paneerselvam - Production and Operations Management - Prentice - Hall of India.
5. Martand T. Telsang - Production Management - S.Chand.

Reference Books:
1. Harding HA - Production Management.
2. Buffa Production Management.
3. Broom Production Management.
4. SN Chari - Production and Operation Management.
5. Khanna OP - Industrial Engineering and Management.
6. Adam and Ebert - Production and Operations Management - Prentice - Hall of India.

CORE PAPER VI

FINANCIAL ACCOUNTING

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, at premium and at discount only – Forfeiture and Re-issue of Shares - Company Final Accounts.

Proportion of Marks: Problems 80% and Theory 20%

Text and Reference Books:

1. Reddy & Murthy - Financial Accounting
2. Grewal. T.S - Introduction to Financial Accounting
3. Jain.S.P- Introduction to Financial Accounting
4. Maheswari.S.N - Financial and Management Accounting.
5. Bhattacharya- Financial Accounting for Business managers.
6. Gupta R.L and Radhaswamy - Advanced Accounting.
7. Shukla. M.C & Grewal .T.S- Advanced Accounting.
8. N. Vinayakam & B. Charrumathi - Financial Accounting
9. Dr. S. Ganeson & S.R. Kalavathi - Financial Accounting.

CORE PAPER VII

STRATEGIC MANAGEMENT

UNIT I

The business system – objectives of the business –mission – vision – goals. strategic analysis of functional areas of 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 – step high strategy– 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 – organizational structure and corporate development – 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.

ERP – Introduction.

Text and Reference Books:
1. Dr. C.B. Mamoria & Dr. Satish Mamoria, Business planning and policy (1987) Himalaya publishing house, Mumbai.
2. Kazmi - Business policy & Strategic Management - Tata McGraw-Hill pub.
3. Azhaskazmi, Business Policy.
4. S.C. Bhattacharya - Strategic Management Concepts & cases - S.Chand.
5.Dr. P.C. Jain- Strategic Management

CORE PARER VIII

OPERATION RESEARCH

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 – 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

REFERENECE BOOKS:

1. Operations Research – Vittal, Margam Publications.
2. Operations Research – J K Sharma, MacMillan.

ALLIED PAPER III

MANAGERIAL ECONOMICS

UNIT I

Definition of Economics – Important concepts of Economics — Relationship between Micro and Macro Economics.

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

UNIT II

Theory of Consumer Behaviour – Managerial Utility Analysis- Indifference Curve and Analysis.

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

UNIT III

Production and Cost Analysis – Law of Returns to Scale- Economies of Scale – Cost Analysis – Different Cost Concepts – 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 — Oligopoly.

UNIT V

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

Reference Books:
1. Mankar: Business Economics, Macmilan Ltd.,
2. Varshney RL and Maheshwari KL - Managerial Economics.
3. Yogesh Maheshwari - Managerial Economics - Prentice-Hall of India.
4. Gupta GS - Managerial Economics.
5. Jinghan M.L. - Micro Economics, Vrinda Publications (P) Ltd. (Theory).
6. Dean - Managerial economics - Prentice-Hall of India.
7. Peterson - Managerial Economics - Prentice-Hall of India.
8. Mote Paul Gupta - Managerial Economics – MGH.
9. Mehta P.L. - Managerial Economics.

SKILL BASED PAPER I

TOTAL QUALITY MANAGEMENT

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 CONCEPTS AND ORIGIN OF TQM:

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

UNIT II: STATISTICAL QUALITY CONTROL AND INSPECTION:

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

UNIT III: PROCESS CAPACITY:

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

UNIT IV: JUST IN TIME & KANBAN:

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

UNIT V: TOTAL PRODUCTIVE MAINTANANCE:

Optimum Maintenance Decisions – Total Productive Maintenance - Process Design – Buyer Seller Relations. **Text Books:**

1. Subburaj, Total Quality Management, Tata mcgraw hill, 2006.

2. Shridhara Bhat, Total Quality Management, Himalaya Publishing house, 2006.

Reference Books:

1. Ansari.A and Modarress, JIT purchasing, Free press, Newyork.

2. Sandeepa Malhotra, Quality Management planning, Deep & Deep, 2006.

MANAGEMENT CONCEPTS

UNIT I

Management – Definition – Importance – Role and Function of a Manager.

UNIT II

Planning – Nature – Purpose _ Steps – Types – Merits and Demerits of planning – MBO.

UNIT III

Organisation – Purpose _Departmentation – Span of Control – Delegation – Centralization and Decentralization – Line and Staff Organization – Committee.

UNIT IV

Directing – Leadership – Motivation – Communication - process of Communication – Barriers of Communication.

UNIT V

Controlling - process of controlling – Co-ordination – Need – Principles .

Text Books:

1. R. N. Gupta - Principles of Management
2. L.M. Prasad - Principles and practice of Management.

CORE PARER IX
MATERIALS MANAGEMENT

UNIT I

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

UNIT II

Inventory Control – Function of Inventory – Importance– Material Demand Forecasting – Material Requisition Planning (MRP) – Tools of Inventory Control – ABC – VED – FSN Analysis –EOQ and EBQ(Only Theory).

UNIT III

Purchase Management –Types of purchases- Duties of purchase manager- Purchasing Procedure – Dynamic Purchasing – Principles – Import Substitution– Import Purchase Procedure.

UNIT IV

Store Keeping– Objectives – Functions of Store Keeper– Centralized and Decentralised Store Room-Bin Cards - Stock Cards. –Material Handling Equipments – Security Measures – Protection and Prevention of Stores from Fire and other Hazards .

UNIT V

Vendor Rating Criteria– Vendor Development – Buyer and Seller Relationship – Value Analysis – ISO.

Text Books

1. Saravanavel P and Sumathi S - Production and Materials Management

2. Chunnawalla and Patel - Production and Materials Management

3. Menon - Stores Management MacMillan

4. Paneerselvam - Production and Operations Management - Prentice - Hall of India

5. Gopalakrishnan - Materials Management - Prentice - Hall of India

Reference Books

1. Muhdnan - Production and Operation Management ,MacMillan

2. Dutta - Integrated Materials Management

3. Veb - Materials Management

4. England and Leenders - Purchasing and Materials Management

5. Varma - Materials Management

6. Gupta & Sharma - Management of system MacMillan India Ltd.

CORE PAPER X
MANAGEMENT ACCOUNTING

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

Ration Analysis – Meaning- Uses –Limitations of Ratios- Types of Ratios (Liquidity ratio, Profitability ratio, Activity and Solvency Ratio).

UNIT III

Fund Flow Analysis – Meaning – Uses- Limitations.

Cash Flow Analysis – Meaning – Uses – Limitations.

UNIT IV

Budgetary Control – Meaning – Objectives – Advantages and Limitations of Budgetary Control –Types of Budgets (Production Budget , Purchase Budget, Flexible Budget and Cash Budget Only).

UNIT V

Marginal Costing – Uses and Limitations of Marginal Costing – CVP Analysis - Assumptions of BE Chart – Simple Problems relating to decision making based on marginal costing.

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

Reference Books:-

1. S.N. Maheswari – Management Accounting – Sultan Chand & Sons, New Delhi.

2. T.S. Reddy & Hari Prasad Reddy – Management Accounting – Margham Publications, Chennai.

3. Manmohan & Goyal – Management Accounting – Saithya Bhavan, Agra.

4. R.S. Pillai & Bhagavathi – Management Accounting – S. Chand & Co. Ltd, New Delhi.

CORE PAPER XI
BUSINESS ENVIRONMENT

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 — Types of Social Organisation.

UNIT IV

Economic Environment – Economic System and their Impact of Business – Macro Economic Parameters like GDP – Growth Rate – 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).

Text and Reference Books:

1. Dr. S. Sankaran - Business Environment.

2. Francis Cherunilam - Business Environment.

3. Aswathappa - Business Environment.

4. Paul - Business Environment.

5. Dasgupta and Sengupta - Government and Business in India.

6. Srinivasan K - Productivity and Social Environment.

7. International Business Environment - Prentice - Hall of India.

CORE PARER XII
FINANCIAL MANAGEMENT

UNIT I

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

Financial Forecasting – Financial Planning and Control – Factors – Objectives.

UNIT II

Current Assets Management – Components – Cash , Receivables and Inventory only .

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 –Cost of Equity Capital – Methods – cost of Debt Capital, Cost of Preference Capital- Cost of Retained Earnings .(Theory only)

UNIT IV

Capital Structure – Significance – Factors in Capital Structure Decision – Features of Optimum Capital Structure – Financial Leverage and Operating Leverage.

UNIT V

Financial Information System – Importance – Features – Functions.

Break Even Analysis – Assumptions and Analysis – Merits and Demerits – Uses – Types – Significance – Profit Cost and Volume Analysis – Theory only.

Text and Reference Books:

1. Fundamentals of financial management - James C. Van Horne- Prentice Hall of India Pvt Ltd., New Delhi.
2. Financial Management and policy - James C. Van Horne - Prentice Hall of India Pvt Ltd., New Delhi.
3. Financial Management - P.V. Kulkarni - Himalaya Publishing House.
4. Financial Management - theory and practice - Prasanna Chandra - Tata McGraw Hill Publishing Co Ltd., New Delhi.

5. Fundamentals of Financial Management - Prasanna Chandra - Tata McGraw Hill Publishing Co Ltd., New Delhi.

6. Financial Management - I.M.Pandey - Vikas Publishing House Private Ltd.,

7. Financial Management - An analytical and conceptual Approach. S.C. Kuchhal - Chaitanya Publishing House, Allahabad.

8. Basic Financial Management - Khan - Tata McGraw Hill Pub.

ALLIED PAPER IV
ORGANIZATIONAL BEHAVIOR

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 .

Text and Reference Books:

1. Rao, VSP and Narayana, P.S. - Organization Theory & Behavior - Konark Publishers Pvt. Ltd., Delhi, 1987.
2. Prasad, L.M - Organizational Theory & Behavior - Sultan Chand & Sons, New Delhi, 1988.
3. Sekaran, Uma - Organizational Behavior-text & cases - Tata McGraw Hill Pub Ltd., New Delhi, 1989.
4. Robbins, P.Stephen - Organizational Behavior-concepts, controversies & Applications - Prentice Hall of India Ltd., New Delhi, 1988.
5. Luthans Fred - Organizational Behavior - McGraw Hill Publishers Co. Ltd., New Delhi, 1988.
6. Aswathappa. K. - Organizational behavior - HPH, Bombay.
7. J. Jayasankar - Organizational behavior.
8. S.S. Khanka - Organizational Behavior.

SKILL BASED PAPER II
TALLY (PRACTICAL ONLY)

1. Create a Company Name

2. How to create a primary group? Explain with your own example.

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 of Trading A/C & P&L, Balance Sheet.

10. Bank Reconciliation Statement

NON-MAJOR ELECTIVE II

TRAINING AND DEVELOPMENT OF EMPLOYEES

OBJECTIVE:

To provide an in-depth understanding of the role of Training in the HRD and to enable the course participants to manage the Training Systems and Processes.

UNIT I: INTRODUCTION

Concepts of Training and Development – Identifying Training Needs – Structure and Functions of Training Development – Evaluation of Training Programme – Role, Responsibilities and Challenges to Training Managers.

UNIT II: TRAINING TECHNIQUES:

On the Job Training Techniques – Coaching – Apprenticeship – Job Rotation – Job Instruction Training – Training by Supervisors – Off the Job Training Techniques – Lecture, Conference, Group Discussion.

UNIT III: CAREER PLANNING:

Concept of Career – Career Stages – Career Planning and Development – Steps in Career Planning – Methods of Career Planning and Development.

UNIT IV: Management Development Program (MDP):

Concept of Management Development – Need and Importance – Process – Components of MDP – Management Development Institutes – Productivity Councils.

UNIT V: TRAINING INSTITUTIONS:

Need for Training in India – Government Policy on Training – Training Institutes in India.

Text Books:
1. Rolf Lynton, Udai Pareek: Training for Development, New Delhi, Sage Publications India (P) Ltd., 1990
2. Raymond Andrew Noe: Employee Training & Development, New Delhi, Tata McGraw Hiss, International Ed., 1999
3. Lynton, R Pareek, U.: Training for Development, New Delhi, Vistaar, 2nd ed., 1990
Reference Books:
1. Rao PL: HRD through In-House Training, New Delhi, Vikas Publishing House (P) Ltd.,
2. Reid M.A.: Training Interventions: managing Employee Development London, IPM, 3rd ed., 1992.
3. Aggarwala, D.V., Manpower Planning, Selection, Training and Development, New Delhi, Deep & Deep Publications (P) Ltd., 1999.

CORPORATE ACCOUNTING - I

Objective

To gain comprehensive understanding of all aspects relating to corporate accounting and to a theoretical foundation for the preparation financial statements

UNIT – I

Issue of Shares – at par, at premium and Discount – Pro-Rata Allotment – Forfeiture and Reissue of Shares

UNIT – II

Issue of Debentures – Redemption of Debentures with and without Provisions – Redemption of Preference Shares

UNIT – III

Acquisition of Business – Profit prior to Incorporation – Final Accounts (Managerial Remuneration Excluded)

UNIT – IV

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: 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%

Reference Book

1. Shukla M.C. Grewal, T.S. Gupta S.C. – Advanced Accounts – S.Chand & CO. Ltd, New Delhi
2. Gupta R.L & Radhaswamy M. – Advanced Accountancy, Sultan Chand & Sons, New Delhi
3. Jain & Narang – Advanc ed Accountancy – Kalyani Publishers
4. Reddy T.S. & Murthy A – Corporate Accounting – Margam Publications, Chennai

Objective: To understand and apply statistics tools in business and economic problems

Unit – I: Nature and significance and limitation of statistics – collection of data – primary and secondary data – classification and tabulation of data.

Unit – II: Diagrammatic and graphical representation of data – Bar diagrams – One dimensional and two dimensional diagrams, pictograms and cartograms, frequency distribution, univariate and Biviriate frequency distribution, Histogram, frequency curves – Ogive curves

Unit – III: Measures of central tendency – Mean – Geometric method - Median and mode – their merits and demerits

Unit – IV: Measures of dispersion – Range, Mean deviation, Quartile deviation, Standard deviation and Lorenz curve, Skewness – Karl pearson and Bowley's co-efficient of skewness - kurtosis

Unit – V: Simple Correlation – KarlPearson's Co-efficient of correlation – Spearman's Rank Correlation – Regression – Regression Equation - Regression lines – simple problems

Reference Books:

1. Gupta: Statistics for Commerce Students

2. Sivathanupillai .M: Elements of Economics and Business Statistics

3. R.S.N. Pillai and Bhagavathi : Statistics

PART -III

CORE PAPER VII

MANAGERIAL ECONOMICS

Objective

To develop an economic approach to executive decision making

UNIT – I

Nature, Scope and significance of managerial economics – Difference between Economics and Managerial Economics – Uses of Managerial Economics

UNIT – II

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 concepts and classifications – Actual, opportunity cost, Incremental cost,Transaction cost, Sunk cost controllable and non – controllable cost, Fixed and variable cost, total Cost, Average Cost Marginal Cost-Cost- output relationship – short – run and long – run - Cost control and - Cost reduction

UNIT – IV

Revenue-Various types of revenue-Break – Even Analysis – Determination of BEP – Assumptions of Break – Even Analysis – usefulness of Break – Even Analysis – limitations of Break – Even Analysis

UNIT – V

Pricing Policy and Pricing Methods – Meaning and objectives of pricing policy – Factors Involved in pricing policy – pricing Methods

Reference Books.

1. Varshney and Maheshwari – Managerial Economics, Sultan Chand & Sons
2. Sankaran S – Managerial Economics, Margham Publicatins, Madras
3. Mehta P L – Managerial Economics, Sultan Chand & Sons
4. Joel Dean – Managerial Economics, Prentice Hall of India Pvt Ltd, New Delhi.

MODERN BANKING

Objective

To provide the students the latest development in the field of banking and financial system.

UNIT – I

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 – Instruments of Credit Control – Quantitative and Qualitative or Selective Credit Control

UNIT – III

Nationalized Banks- Schedule Banks – Commercial Banks—Regional Rural Banks.

UNIT – IV

Money Market Structure and its Importance – Mutual Fund – kinds, advantages, drawbacks - Development Banking - Industrial Finance Corporation Of India (IFCI)- Industrial Development Bank of India (IDBI) - SIDBI Small Industries Development Bank of India

UNIT – V

Recent Practices– Debit Card, Credit Card, ATM and e-Banking, Mobile banking- Electronic fund transfer – Electronic clearing System - PIN

Reference Books

1. K.P.M Sundaram and E.N. Sundaram, Modern Banking, Sultan Chand & Sons, New Delhi
2. Shekhar & Shekhar , Banking and Financial System, Margham Publications, Chennai -17
3. B. Santhanam, Banking and Financial System, Margham Publication, Chennai – 17
4. Dr.V. Balu , Banking and Financial System, Sri Venkateswara Publications, Mylapore, Chennai – 04
5. Radhaswami and Vasudevan, A text book of Banking (Law, Practice and Theory of banking)

ALLIED-II PAPER -III

FINANCIAL MARKETS

Objective

1. To know the basic ideas of Indian capital market
2. To understand the functioning of primary and secondary capital market
3. To familiarize the student about stock trading.

UNIT: I   Financial System in India

Functions of financial system- capital markets- its importance-money market-development of financial system in India-weaknesses of Indian financial system-money market Vs capital market.

UNIT: II Primary Market

Meaning – SEBI Functions- Stock Exchange- Functions of new issues market – Methods of floating new issues – Guidelines – Steps – Instruments – Players – Recent trends – Advantages of new issues.

UNIT: III Secondary Market

Control of secondary market – Recognition and services of stock exchanges – organization of stock exchanges in India – Traditional structure of Indian stock exchanges. Listing of Securities – A, B and C groups of shares – Advantages, drawbacks, procedure, criteria and obligations of listing.

UNIT: IV Trading

Registration, procedure, code of conduct and functions of brokers. Kinds of brokers - Method of trading in stock exchange – on-line trading- NSE-NEAT system-carry over or badla- genuine trading Vs Speculative transactions. Stock indices –Recent developments**.**

UNIT: V Financial Derivatives

Meaning – Definition- kinds of financial derivatives – forwards, futures, options and swaps.

Reference Book

1. Bukley   :   Multi National Finance, Prentice Hall, New Delhi
2. David osiur   :   Understanding Electronic Commerce, Microsoft Press,
                              Prentice Hall of India.
3. Don apscott   :   Growing up Digital, The Rise of the New Generation Oakton,
                              Vs United States.
4. Donapscott   :   Digital Capital: Harnessing The Power of Business Webs.

PART -IV
SKILL BASED PAPER - I
ISLAMIC ECONOMICS

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- Man and Man-Environment relations- Derivation and its implications – Freedom of Choice with accountability as essential feature of Islamic view of life.

Unit: II

Islamic view of property as a trust –Freedom of enterprises- Role of state is ensuring a minimum realization of welfare.

Unit: III

Riba-Bank Interest and rational 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 – and 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. Ahmed Habib (Ed), Theoretical Foundation of Islamic Economics, Islamic Research and Training Institute, IDB, 2002
2. Chapra M.U, What is Islamic Economics Jeddah, IRTI, IDB, 1996, Leicseter, UK: the Islamic Foundation 1985
3. Siddiqui M.N. Some aspect of Islamic Economy, Delhi, MMI Publishers 2002
4. Comparative Economics of Some Islamic Financing Techniques- M.Fathima Khan
5. Introduction to Islamic Economics system
6. Journal of Economic Co-operation Among Islamic countries
7. Obaidullah, Mohammed Islamic Financial Services, Islamic Economic Research Centre, King Abdul Aziz University, Jeddah, Saudi Arabia 2005.

NON MAJOR ELECTIVE – I

FUNDAMENTALS OF ECONOMICS – I

UNIT – I

Definition, Meaning and scope of Economics - Nature of Economic Laws.

UNIT - II

Positive - Normative Economics

UNIT – III

Islam as an alternative economics

UNIT – IV

Consumer's behaviour wants – Utility

UNIT – V

Demand Meaning – Law – Exceptions.

Reference Books

1.	Ahuja, H.L.	:	Advanced Economic Theory S.Chand & Co
2.	Dewett K.K	:	Modern Economics Theory
3.	Lipsey and Steiner	:	Economics
4.	Sankaran.S.	:	Micro Economics Margham Publications.
5.	Agrawal, A.N.	:	Indian Economy – Vikas Publishing House.
6.	Dewett, Verma, Sharma	:	Indian Economy – S.Chand & Co
7.	Rudar Datt & Sundaram	:	Indian Economy – S.Chand & Co
8.	Sankaran.S.	:	Indian Economy - Margham Publications

IV SEMESTER
PART - III
CORE PAPER IX
CORPORATE ACCOUNTING II

Objective

To gain accounting knowledge insurance companies and inflation accounting.

UNIT–I

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 – Order of Payment – Preferential Payments – Liquidator Final Statement of Accounts – Statement of Affair and Deficiency Accounts.

UNIT – III

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 External Reconstruction of a Company (Inter Company Investment excluded)

UNIT – V

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

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

Reference Books

1. Shukla M.C. Grewal, T.S. Gupta S.C. – Advanced Accounts, S. Chand & Co. Ltd, New Delhi
2. Gupta R.L & Radhaswamy M. – Advanced Accountancy, Sultan Chand & Sons, New Delhi
3. Jain & Narang – Advanced Accountancy – Kalyani Publishers
4. Reddy, T.S. & Murthy A. Corporate Accounting – Margham Publication, Chennai

Unit – I: Methods of Sampling – Simple random sampling – stratified random sampling – systematic Sampling – Methods of economic survey

Unit – II: Index number – Introduction – Uses of Index numbers – Un weighted index number – Simple aggregate method and Simple average of Price relative method – Weighted Index number – Laspyes, paasches method, Dorbish, Bowly's , Marshall – Edgeworth index number – TRT – FRT – Chain base index number and fixed base index numbers – consumer price index number – wholesale price index number.

Unit – III: Time Series – Trend – Seasonal, Cyclical, Irregular Variations - Methods of eliminating their influence - Measurement of Trend – Secular Trend by simple average method

Unit – IV: Testing of Hypothesis – t Test - Chi- Square Test

Unit – V: Study of Indian Statistics - NSSO, CSO, Census and Vital statistics in India.

Reference:
1. Gupta: Statistics for Commerce Students
2. Sivathanupillai .M: Elements of Economics and Business Statistics
3. R.S.N. Pillai and Bhagavathi : Statistics

Objective:

To gain the business knowledge of management and becomes professionalization in management.

UNIT-I
Concept of Management – Meaning and Definitions – Nature and Characteristics of Management – Management Vs Administration – Levels of Management – Importance of Management and Scope of Management – Principles of Management.

UNIT – II

Process of Management – 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

UNIT-III
Organizing – Principles of Organization – Authority and Responsibility – Line and Staff Organization- Functional Organization- Matrix organization –Organization of Charts and Manual – Span of management and control.

UNIT – IV

Directing: Principles of Delegation – Delegation Vs Decentralization – Principles and Techniques of Directing – Role of Communication – Co – ordination – internal and external -techniques of controls.

UNIT – V

Leadership – Qualities of a Good Leader – Types of Leadership – Co-ordination and control – Problems in Co–ordination – Steps Involved in Control Process

Reference Books

1. Business Management – Dr. C.B Gupta – Sultan Chand & Sons
2. Management Principles and Practices – Lallan Prasad & S.S Gulshan & S. Chand & Co.
3. Principles of Management – Konntz, Weihrich and Aryasri & Tata McGraw Hill
4. Principles & Practice of Management – Dr.H.C. Das Gupta & Sahitya Bhawan Agra

IV SEMESTER
PART - III
CORE PAPER XII
BANKING LAW AND PRACTICE

Objective

To gain knowledge of 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

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 – Meaning – Features – Types – Cheques, Promissory Note, Bills of Exchange –Cheques –Features of a Cheques – Specimen of a Cheque – Material Alterations

UNIT – IV

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 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.

Reference Books

1. K.P.M. Sundharam and P NVarshney – Banking Law and Practice – Sultan Chand & Sons
2. Kandasami, Natarajan and Parameswaran – Banking Law and Practice – S. Chand & Co.,
3. B. Santhanam, Banking Law and Practice – Margham Publications
4. K.P. Kandasami – Banking Law and Practice – S. Chand & Co.,

Objective

To enable the students to understand the salient features of India and her occupational structure; to assess the relative share of agriculture, Industry and Service sector in the economy and to analyze the fruits of planning
.

UNIT–I

Meaning and Characteristics of Underdevelopment – Salient Features of Indian Economy – Factors responsible for development – development as distinct from growth – a comparison between India and other developing economies like SAARC, Taiwan,– Developed countries.

UNIT–II

Role of Agriculture in Indian Economy - Problems of Low Agricultural Productivity – Land Reforms – Need and Scope- Food Problem, Food Security and Green Revolution, Mechanisation – desirability and feasibility.

UNIT – III

Industry – Importance – Role of Small and Micro Enterprises – Role of large scale Industries- Industrial Sickness causes and measures; Industrial Policy Resolution of 1956, 1985, 1991, 2003.

UNIT – IV

Planning in India – Meaning, Process, and approaches. Five Year Plans – Objectives in General - targets and performance.

UNIT – V

New Economic policy and its impact on Indian Economy – Liberalization – Privatization – Globalization.

Reference Books

1. RudarDatt&Sundaram, Indian Economy S.Chand& Co, New Delhi
2. M.L. Jhingan, Economics of Development & Planning, Konark Publishers, New Delhi
3. Dr.S. Sankaran, Indian Economy, Margham Publications, Chennai
4. RBI Bulletin, PramitChandhury, The Indian Economy, Poverty and Development Vikas Publishing House, New Delhi
5. Velayutham Foreign Trade,Theory& Practice, S. Chand & Co.,

IV SEMESTER
PART – IV
SKILL BASED PAPER - II
E-COMMERCE

Objective:-

This syllabus is being designed to impact knowledge on it various facts of electronic commerce. It provide to students exciting journey into it enticing world of electronic commerce.

UNIT: I

Evolution – Meaning - Definition of E-commerce - Advantages to business

UNIT: II

Advantages to consumer society and nation –E-commerce – driving forces- internet usage – Growth of E-commerce in India.

UNIT: III

Tools and Application of E- commerce– Internet, e- governance, networking , classification –internet of www –intranet & Extranet.

UNIT: IV

Online shopping – Advantages – Disadvantages – advice to the online shopping – E-marketing – E- advertising – E- payment – E-security.

UNIT: V

Cyber crime and cyber law – mobile commerce.

Reference Books

1. Electronic Commerce – Elias M. Awad

2. E-Commerce – Prof V.P. Gupta and Dr. M.C. Sharma

3. E-Commerce – S. Jaiswal

4. E-Commerce on Marketing – Pravin Kumar, Tayal/Sugan, C.Jain

NON MAJOR ELECTIVE – II
FUNDAMENTALS OF ECONOMICS – II

UNIT – I

Meaning – Objectives of plans – Priorities of plan

UNIT – II

National Income: Meaning – Methods of Calculating National Income – Difficulties and methods to overcome the difficulties – Recent trends in India's National Income and Per-capita income.

UNIT – III

Gross Domestic Products – State Domestic Products

UNIT – IV

New Economic Policy – Liberalization- Privatization and Globalization

UNIT – V

Human face of liberalization.

Reference Books

1.	Ahuja, H.L.	:	Advanced Economic Theory S.Chand & Co
2.	Dewett K.K	:	Modern Economics Theory
3.	Lipsey and Steiner	:	Economics
4.	Sankaran.S.	:	Micro Economics Margham Publications.
5.	Agrawal, A.N.	:	Indian Economy – Vikas Publishing House.
6.	Dewett, Verma, Sharma	:	Indian Economy – S.Chand & Co
7.	Rudar Datt & Sundaram	:	Indian Economy – S.Chand & Co
8.	Sankaran.S.	:	Indian Economy - Margham Publications

III SEMESTER
CORE IV
COMMERCIAL LAW

Objectives:

To give an exposure to the students, of some of the important laws, which are essential for an understanding of, the legal implications of the general activities of a modern business organization. To provide to the students basic understanding of some of the business laws, which have a bearing on the conduct of business activities .

UNIT-I

Meaning of law – Sources of law – Classification of Contract – Express and implied – Valid, Void and Voidable contracts – Executed and Executory contracts – Unilateral and Bilateral contracts.

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

Law of Sale of Goods – Conditions and Warrantees - Discharge of Contract – Remedies for Breach of Contract – Auction Sale.

Reference Books:

1. Mercantile Law – N.D. Kapoor
2. Elements of Commercial Law – N.D. Kapoor
3. Mercantile Law – M.C. Shukla

CORE V

CORPORATE ACCOUNTING – I

Objective:

To gain comprehensive understanding of all aspects relating to corporate accounting and to be a theoretical foundation for the preparation of financial statements.

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 accounts and balance sheet as per provisions of Companies Act- calculation of managerial remuneration.

UNIT-V

Liquidation Accounting – Order of Payment – Liquidator's Final Statement of Accounts.

(Weightage of Marks – Problems: 80% & Theory: 20%)

Reference Books:

1. ShuklaM.C.Grewal, T.S.Gupta – Advanced Accounts – S.Chand& Co. Ltd, New Delhi

2. Gupta R.L. &Radhaswamy. M – Sultan Chand & Sons, New Delhi

3. Jain &Narang – Advanced Accountancy – Kalyani Publishers

4. Reddy T.S. & Murthy A. – Corporate Accounting – Margham Publications, Chennai

DATABASE MANAGEMENT SYSTEM (Theory)

III Semester B.Com [C.A]

Objective :

To gain basic knowledge of Database architecture, models and its applications.

UNIT-I

Introduction to DBMS-Database Architecture and Design- Data Models-ER Model-Mapping Constraint-Keys-ER Diagrams

UNIT-II

RDBMS-CODD's Rules-Relational Data Integrity and Database Constraints-Relational Algebra and Relational Calculus

UNIT-III

SQL-Basic Structure-Characteristics of SQL-Advantages-Types of SQL Commands-SQL Operators-Tables, Views and Indexes

UNIT-IV

Set Operations-Aggregate Functions-Character Functions-Nested Sub queries-Modification of Database-Joined Relations-DDL-Embedded SQL

UNIT-V

Relational Database Design-Pitfaills-Normalization using Functional Dependencies-Oracle-Introduction-Features, uses, advantages of Oracle-Integrity Constraints-PL/SQL Applications- PL/SQL Block, Procedure and Functions

Text Books:

1. Singh-Database Systems:Concepts,Design & Applications, Pearson Education.
2. Abraham SIlberschatz,H.F.Korth and S.Sudarshan-Database System Concepts, MGH Publications.
3. Gerald.V.Post-DBMS Designing and business applications-MGH Publications
4. Michael Abbey and Michael.J.Corey-Oracle-A Beginners Guide,TMH
5. Alexis leon,Mathews Leon, Essential of DBMS,Vijay Nicole
   http://WWW.leon-leon.com/ds/edbms

CORE PRACTICAL III
DBMS [Practicals in SQL and PL/SQL]

Objective :

To gain practical knowledge of Database architecture, models and its 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	NOT NULL	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 employees whose salary exceeds their manager

4. Create a table client-master with the following fields: client-no, client-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 the 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, user name, 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 Aluminus in an Institution. Write a PL/SQL block to change the address of particular alumni.

ALLIED III

STATISTICS I

Objectives:

After studying this subject the student will be able to understand meaning of statistics – Collection of Data and Tabulation, Diagrammatic and Graphic presentation of data, Measures of Central Value or Averages, Measures of Dispersion and Measures of Skewness.

UNIT-I: MEANING OF STATISTICS – DATA COLLECTION AND TABULATION

Meaning, Scope, functions, uses and limitations of statistics – Primary and Secondary data collection – Questionnaire – Classification and Tabulation – Frequency Distribution.

UNIT-II: DIAGRAMMATIC AND GRAPHIC PRESENTATION OF DATA

Importance and limitations of Diagrams and Graphs – Types – Bar diagrams and pie Diagram – Simple graph, Histogram, Frequency polygon, Frequency curve and Ogive.

UNIT-III: MEASURES OF CENTRAL VALUE OR AVERAGES

Meaning, Merits and Limitations – Arithmetic Mean, Median, Quartiles, Mode, Geometric Mean and Harmonic Mean.

UNIT-IV: MEASURES OF DISPERSION

Meaning, Merits and Limitations – Range, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Variation.

UNIT-V: MEASURES OF SKEWNESS

Meaning, Merits and Limitations – Karl Pearson's Coefficient of Skewness – Bowley's Coefficient of Skewness.

Reference Books:

1. Elements of Statistical Methods – S.P. Gupta
2. Fundamentals of Statistics – B. N. Gupta
3. Business Statistics – R.S.N. Pillai
4. Business Statistics – P.R. Vittal

SKILL BASED SUBJECT I
PRINCIPLES 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 of life Assurance – 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 of marine insurance – functions of marine insurance – proximate clause – subrogation and contribution.

UNIT-IV

Types of marine policy – clauses in general use – warranties – kinds of marine losses – reinsurance and double insurance.

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.

Text and Reference Books:

1. Dr. B. Vardharajan – Insurance Vol 1 and 2 – Tamil Text Book
2. R.S. Sharma – Insurance Principles & Practice – VaraBombay, 2006.
3. A. Murthy – Elements of Insurance
4. Risk Management & Insurance – Harrington, 2006 – Tata McGraw Hill pub.

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NON-MAJOR

ELECTIVE I

SERVICES MARKETING

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UNIT-I: INTRODUCTION

Services Marketing Management – Concept of Services Marketing – Future of the service sector – Services Characteristics – Difference between goods and services – importance of services marketing management.

UNIT-II: SERVICE MARKETING MIX

Meaning of Marketing mix – Service marketing mix – Definitions – Characteristics – Product Life cycle – Pricing for services – Promotion mix (Communication mix).

UNIT-III: LOCATION OF SERVICES AND CHANNELS OF DISTRIBUTION

Service location – Factors to be considered in choosing a service location – classification of services by location – Channels – Methods of distributing services – Direct and Indirect distribution – Franchising – Agents – Types – Identifying and evaluating major channel of distribution.

UNIT-IV: TYPES OF MARKETING IN SERVICE FIRMS

Internal marketing – Definition – Objectives – Role of internal marketing – External Marketing – Distinction between internal and external marketing – Relationship marketing – Goals – Benefits – Customer relationship management.

UNIT-V: MARKETING OF SERVICES

Financial Services: Banking, Health services, Tourism services and Tele communication services.

Reference Books:

1. Service Marketing and Management – Balaji.B – S.Chand
2. Service Marketing – Dr. L. Natrajan – Margham publication.
3. Kenneth E.Clow, David L.Kuirtz, Services Marketing, 2e Operation, Management and Strategy, Biztantra Publication, New Delhi, 2003.

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NON-MAJOR

ELECTIVE II

PROJECT MANAGEMENT

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UNIT-I: INTRODUCTION

Introduction – Project defined – Distinctive Characteristics of a project – Importance of study of Project management – Classification of Projects – Project Life Cycle – Project idea and Innovation, Project Selection.

UNIT-II: PROJECT FORMULATION

Meaning of Project Report – Significance of PR – Contents of PR – Formulation of PR – Specimen of PR – Common errors in Project formulation.

UNIT-III: PROJECT APPRAISAL AND EVALUATION

Concept of Project appraisal – Objectives – Methods of Project appraisal – Pay back period – Average rate of return – Discounted cash flow techniques – Project risk – Project risk classifications – methods of minimizing risk.

UNIT-IV: PROJECT FINANCING

Introduction – Sources of Project finance – Fixed Capital – Working capital – Sources of Long-term finance, financial institutions, Sources of short term finance, over-run finance, Lease finance – Bridge finance – Venture Capital.

UNIT-V: ROLE AND LEADERSHIP OF THE PROJECT MANAGER

Introduction – Duties and responsibilities of Project manager – Project manager as a leader: Salient Features.

Reference Books:

1. Project Management and Control – By P.C. K. Rao – Sultan chand & Sons
2. Total Project management - By Joy P.K. – Macmillion India Ltd.

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Non-Major

ELECTIVE III

TALLY (THEORY)
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UNIT: I

Introduction to Accountancy – Introduction to Tally fundamentals – Maintenance of company Data – Concept of Ledger – Configuration of chart of Accounts - How to make entries in Cash book – Purchase book – Sales book – Invoice – Purchase return book – Sales return book – Petty cash book – Configuration in tally

UNIT: II

Introduction to Bills – Details of bills –Entries in Trail balance – How to create new groups – master configuration – Accounts masters – readymade creation – List of groups – How to alter groups – creation of primary groups – Secondary group creation

UNIT: III

Introduction to VAT – VAT activation and classification – Creating of ledger – Stationary ledger – Display the created ledger .

UNIT: IV

Concepts of voucher – Creation of receipt voucher – Payment voucher – Credit note – Remove the voucher – Print the voucher – Accounting input credit on opening stock – Accounting of interstate branch transfer – VAT computation – VAT Form – CST introduction – Ledger Creation – Creating vouchers – CST reports

UNIT: V

TDS Introduction – Configuration of Tally for TDS - Creation of balance sheets – concept of trial balance in tally – balance sheet – sales registers – Purchase registers – Sales vouchers – concept of ageing – receivable ageing – receivable ageing – TDS Report – Configuring Tally for Service Tax – Master Creation – Service Tax Reports

BOOKS RECOMMENDED:

1. TALLY, Sridharan, Narmadha publications, May 2003.
2. E-Commerce, a guidance, Rajamalar, Narmadha publications, May 2003.

❖ **Students can select any one Non-Major paper in III semester & IV semester (II year students)**

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CORE VII

CORPORATE ACCOUNTING - II

Objective:

To gain accounting knowledge in banking & insurance companies and inflation accounting.

UNIT-I

Valuation of Goodwill – Need – Factors Effecting the Valuation – Methods – Average Profit, Super Profit, Annuity and Capitalization Methods, 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 – Elimination of Common Transactions – Unrealized Profits – Revaluation of Assets and Liabilities – Bonus Shares – Consolidated Balance Sheet (Inter Company Investment Excluded).

UNIT-III

Bank Accounts: Rebate on Bills Discounted, Interest in Doubtful Debts, Preparation of Profit and Loss Account and Balance Sheet with Relevant Schedules (New Method) – Non-Performing Assets (NPA).

UNIT-IV

Insurance Company Accounts: Life Insurance – Revenue Account, Valuation Balance Sheet and Balance Sheet (New Method). General Insurance Fire and Marine Revenue Account, Profit and Loss Appropriation Account and Balance Sheet (New Method).

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%)

Reference Books:

1. Shukla M.C.Grewal, T.S.Gupta – Advanced Accounts – S.Chand & Co. Ltd, New Delhi
2. Gupta R.L. & Radhaswamy. M – Sultan Chand & Sons, New Delhi
3. Jain & Narang – Advanced Accountancy – Kalyani Publishers
4. Iyengar S.P. – Advanced Accounting – Sultan Chand & Sons, New Delhi
5. Reddy T.S. & Murthy A. – Corporate Accounting – Margham Publications, Chennai

COMPANY LAW

Objective:

To enable the students gain basic knowledge in company law.

UNIT-I

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 o business.

UNIT-III

Prospectus – its 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.

Reference Book:

1. Company Law – N.D. Kapoor, Sultan Chand & Sons.

ALLIED IV

STATISTICS II

Objective:

After studying this subject the student will be able to understand 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-Laspeyer'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.

Reference Books:

5. Elements of Statistical Methods – S.P. Gupta
6. Fundamentals of Statistics – B. N. Gupta
7. Business Statistics – R.S.N. Pillai
8. Business Statistics – P.R. Vittal

CORE IX

VISUAL BASIC PROGRAMMING (THEORY)

Objective:

To enable the students gain deep knowledge in visual basic programming.

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: 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.

UNIT – III
Writing Code in Visual Basic: Language constructs – For… Next, The while loop, Select Case… End Select, Exit statement, With Structure. 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).

UNIT – IV
Introduction to Built-in ActiveX control – Toolbar – the Image list control – Common Dialog control – Status bar control – Rich textbox control – Menu editor.

UNIT – V
Database access – Data Control – Field control – Data grid record set using SQL to manipulate data – Open Data Base Connectivity.

Text Books Recommended:
1. Mohammed Azam, Programming with Visual Basic 6.0 – Vikas Publishing House
2. Content Development Group, Visual Basic 6.0 – Tata McGraw Hill

CORE PRACTICAL IV

VISUAL BASIC PROGRAMMING (LAB)

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.

SKILL BASED SUBJECT II

MARKETING MANAGEMENT

Objective:

To enable the students gain deep knowledge in 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 – Buying, Assembling – Selling.

UNIT – III

Transportation – Storage and Warehousing – Warehouses in India – Causes of Slow growth – Suggestions.

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.

Reference books:

1. Marketing by Rajan Nair, Sultan Chand & Sons.
2. Modern Marketing by R.S.N. Pillai, S. Chand and Company Ltd., New Delhi.
3. Marketing Management in Indian Perspective by Jha and Singh, Himalaya.
4. Fundamentals of Marketing by William J. Stanton, MC Graw – Hill.
5. Principles of Marketing by Philip Kotler, Prentie Hall.
6. Fundamentals of Modern Marketing by Cundiff, Still and Govani.

CORPORATE ACCOUNTING – I
(Subject Code: U3CO3001)
(5 Hours)

UNIT – I: Issue of Shares

Issue of Shares – At Par, Premium and Discount – Pro-rata Allotment – Forfeiture and Reissue of shares – Underwriting of Shares - Accounting Treatment.

UNIT – II: Issue and Redemption of Debentures and Preference shares

Issue of Debenture – Redemption of Debenture with and without Provisions – Redemption of Preference Shares – At Par, Premium and Discount – Accounting Treatment.

UNIT – III: Acquisition of Business and Final Accounts of Joint Stock Companies

Acquisition of Business – Profit Prior to Incorporation – Final Accounts of Joint Stock Company (Managerial Remuneration excluded)

UNIT – IV: Amalgamation, Absorption and External Reconstruction

Amalgamation – Absorption and External Reconstruction of a Company (Inter Company Investment excluded)

UNIT – V: Alteration and Internal Reconstruction of Share Capital

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

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

Reference Books:
1. Shukla M.C, Grewal T.S, Gupta S.C – Advanced Accounts, S. Chand & Co. Ltd.,   New Delhi.
2. Gupta R.L & Radhaswamy M – Advaced Accountancy, Sultan Chand & Sons, New Delhi.
3. Jain S.P & Narang K.L – Advanced Accounting, Kalyani Publishers.
4. Reddy T.S & Murthy A – Corporate Accounting, Margham Publications, Chennai.
5. Maheshwari S.N. & Maheshwari S.K., Corporate Accounting, Vikas Publication, New Delhi.

BUSINESS LAW
(Subject Code: U3CO3002)
(5 Hours)

UNIT –I: Indian Contract Act, 1872

Introduction - Contract – Meaning – Characteristics – Essential elements of a valid contract - Offer – Types – Essentials of valid offer – Revocation of an offer – Acceptance – Essentials of valid acceptance – Revocation of acceptance – Agreement – Void agreement – Consideration – Essentials.

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 of contract – Quasi contract – Features - Types.

UNIT – III: Discharge and Remedies for Breach of Contract

Modes of discharge of contract – Discharge by performance, by agreement, by lapse of time, by operation of law, by breach of contract – Remedies for breach of contract.

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

Bailment – Essentials – Kinds – Duties and rights of Bailor and Bailee – Finder of lostgoods – Rights and duties of finder of lost goods – Pledge – Essentials – Rights and duties of Pawnor and Pawnee – Contract of sale – Essentials – Sale and Agreement to sell – Sale and Hire purchase.

UNIT – V: Contract of Agency and Insolvency

Rules of Agency – Duties and Rights of Agent- Duties and Rights of Principal – Termination of Agency – Insolvency – Procedures – Official assignee – Official receivers – Powers and duties.

Reference Books:

1. N.D.Kapoor, Business law, Sultan & Sons New Delhi.
2. R.S.N.Pillai & V.Bagavathi, Business Law, S.Chand & Sons New Delhi.
3. M.C.Shukla, Mercantile law, S.Chand & Sons New Delhi.
4. B.S.Mosal, Business & Industrial Law, Ane Books (P) Ltd., New Delhi.
5. Kavitha Krishnamoorthy, Business Law, Vision Publishing House, New Delhi.

PRINCIPLES OF MARKETING
Subject Code: U3CO3003)
(5 Hours)

UNIT-I: Introduction to Marketing

Meaning and Definition of Marketing – Importance – Functions of Marketing - Marketing Concepts – Selling Vs Marketing - Approaches to the study of Marketing.

UNIT-II: Market and Segmentation

Marketing Mix – Market Segmentation – Concept, Importance and Bases for Market Segmentation – Meaning of Target Market.

UNIT-III: Product and Price

Concept of product – Consumer goods and Industrial goods – Product planning and development – Product Life Cycle – Packaging – Branding, Labelling and Trademark.

Meaning of Price – Importance of price – Factors affecting pricing – Various methods of pricing – Pricing a new product.

UNIT-IV: Distribution Channels

Channels of Distribution - Meaning and Importance – Factors affecting choice of Distribution Channels – Retailer – Wholesaler.

UNIT-V: Buyer Behaviour

Meaning of buyer, consumer and customer – Factors influencing buyer behaviour – Buying decision process – Consumerism.

Reference Books:
1) Philip Kotler, Marketing Management, Pearson Education, New Delhi.
2) N.Rajan Nair, C.B.Gupta, Marketing Management, Sultan Chand & Sons, New Delhi.
3) S.A.Sherlekar, Marketing Management, Himalaya Publishing House, Mumbai.
4) A.Kumar & Meenakshi, Marketing Management, Vikas Publishing House, New Delhi.
5) R.Saxena, Marketing, Himalaya Publishing House, Mumbai.

MODERN BANKING
(Subject Code: U3CO3004)
(5 Hours)

UNIT- I: Banking

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

UNIT – II: Bankers and Customers

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

UNIT – III: Central Banking System

Functions of a Central Bank, Credit Creation, Credit Policy of RBI and its Impact, RBI's relationship with the Central Government.

UNIT – IV: Recent Trends in Banking

Priority sector lending - Credit to Agriculture & Allied Activities - Micro Credit to Self Help Groups - Foreign Investment in Micro-Credit Projects.

UNIT – V: Technological Developments in Banking

E-Commerce in Banking – Hi-tech Banking – Core Banking – Mobile Banking, Tele-banking - RTGS, NEFT, Debit cards, Credit cards and Smart cards.

Reference Books:

1. K.P.M. Sundaram, E.M. Sundram, Modern Banking, Sultan Chand & Sons Ltd., New Delhi.
2. Prof.D.Mureleedharan, Modern Banking Theory & Practice- Asoke K.Ghosh, PHI Learning Private Limited, M-97, New Delhi-110001
3. Prof. D. Surya Chandra Rao, Banking Reforms in India, Regal Publications, New Delhi.
4. B. Santhanam, Banking and Financial Services, Margham Publications, Chennai.
5. Dr.V.Balu, Banking and Financial System, Sri Venkateswara Publications, Chennai.

Unit I: Introduction

Statistics – Meaning and Definition – Functions – Limitations – Scope – Probability – Definition - Addition Theorem – Multiplication Theorem – Conditional Probability.

Unit II: Data Collection

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 – Graphical and Diagrammatic presentation of data using Bar diagram, Pie diagram, Histogram and Frequency Polygon.

Unit III: Measures of Central Tendencies

Measures of Central Values – Arithmetic Mean - Weighted Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean.

Unit IV: Measures of Dispersion and Skewness

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

Unit V: Operations Research

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

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

Reference Books:

1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. S.P. Gupta, P.K. Gupta and Manmohan, Business Statistics and Operations Research, Sultan Chand & Sons, New Delhi.
3. P.R. Vittal, Business Statistics and Operations Research, Margham Publications, Chennai.
4. R.S.N. Pillai and Bhagavathi, Statistics – Theory and Practice, S. Chand & Co. Ltd., New Delhi.
5. Manmohan, Kanti Swarup and P.K. Gupta, Operations Research, Sultan Chand & Sons, New Delhi.

BUSINESS COMMUNICATION
(Subject Code: U3COSB31)
(Skill Based Paper – 3 Hours)

UNIT – I: Communication

Meaning – Objectives of Communication – Importance of effective communication in business- Types of communication – Principles – Barriers of Communication.

UNIT – II: Business Letters

Business letter – Functions - Kinds of business letters – Essentials of an effective business letter – Lay out of a business letter.

UNIT – III: Enquiries and Replies

Enquiries – Replies – Offers and Quotations – Important terms used in offers and Quotations – Orders and their execution.

UNIT – IV: Collection Letters

Collection letter – Effective collection letter – Collection series - Replies of debtors - Circular letters - Objectives of writing Circular Letters – Specimen of circular letter.

UNIT – V: Application Letters

Introduction – Contents – Specimen of Application Letter – Curriculum Vitae – Interview Letter.

Reference Books:

1. Ramesh and Pattan Chetti, Business Communication, S.Chand & Co., New Delhi
2. Rajendra Pal, J.S. Koralhalli, Essential of Business communication, Sulthan Chand & sons New Delhi.
3. Shirley Taylor, Communication for business, pearson publication, New Delhi.
4. Dr.Sundar, Business Communication, Vijay Nicole Publishing Co., Chennai.
5. N.S. Raghunathan, B.Santhanam, Business Communication Margham Publication, Chennai.

NON-MAJOR I- GENERAL COMMERCIAL KNOWLEDGE

Subject Code: U3CONM31
Credit:2
Semester- III
Hours:2

Objective:

To gain the students to acquire basic knowledge of Trade, Industry and Commerce.

UNIT – I

Commerce, Trade , Industry – Meaning – Scope and Importance of Commerce – Economic Basis of Commerce.

UNIT – II

Forms of Business Organizations – Sole Trade – Partnership firm-Features - Merits and Demerits – Types of Partners.

UNIT – III

Joint Stock Company – Features – Memorandum and Articles – Contents – Prospectus and contents – Shares and Debentures – Types – Co-operative – Features – Types – Advantages.

UNIT IV

Office Organization – What is an Office? Functions of Office – Office Accommodation and Environment – Office Layout – Office Manual.

UNIT V

Handling of Mail, Filing and Indexing – Inward/Outward Mail – Filing and Indexing System, Essentials and Classification –Methods- Horizontal vs Vertical Filing – Centralized and Decentralized – Indexing**.**

Reference Books:

1. General Commercial Knowledge – Ghosh and Bhushan – Sultan Chand & Sons, New Delhi.
2. Commerce – Principles & Practice – P.N.Reddy & Gulshan – S. Chand & Co., New Delhi.
3. Principles of Commerce and General Commercial Knowledge – K.L.Nagarajan, Vinayagam, Radhasamy ans Vasudevan S. Chand & Co., New Delhi.

CORPORATE ACCOUNTING – II
(Subject Code: U3CO4001)
(5 Hours)

UNIT – I: Valuation of 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 Assets, Yield and Fair Value Methods.

UNIT – II: Liquidation Accounting

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

UNIT –III: Accounts of Banking Companies

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

UNIT – IV: Accounts of 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 - Limitation 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%

Reference Books:

1. Shukla M.C, Grewal T.S, Gupta S.C – Advanced Accounts, S. Chand & Co. Ltd., New Delhi.
2. Gupta R.L & Radhaswamy M – Advaced Accountancy, Sultan Chand & Sons, New Delhi.
3. Jain S.P & Narang K.L – Advanced Accounting, Kalyani Publishers.
4. Reddy T.S & Murthy A – Corporate Accounting, Margham Publications, Chennai.
5. Maheshwari S.N. & Maheshwari S.K., Corporate Accounting, Vikas Publication, New Delhi.

COMPANY LAW
(Subject Code: U3CO4002)
(5 Hours)

Unit-I: Introduction to Joint Stock Companies

Meaning, Nature and Kinds of Companies – Advantages and Disadvantages of Joint Stock Companies – Conversion of a Private Company into a Public Company and Conversion of a Public Company into a Private Company – 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

Meaning and Contents of Memorandum of Association – Meaning and Contents of Articles of Association – Distinction between Memorandum of Association and Articles of Association. Meaning and definition of Prospectus – Conditions for the issue of prospectus – Statement in lieu of prospectus – Contents of prospectus.

Unit-III: Concept of Capital and Borrowings

Introduction to Equity Capital -Share Capital – Kinds of shares – Procedures for the issue of shares, Bonus Issues - Private Placement - Underwriting - Equity with differential rights, Rights issue, Sweat Equity Shares, Employee Stock Option Scheme – Alteration in Share Capital. Introduction to Debt Capital – Debentures- Types of Debentures – Bonds – Types of Bonds.

Unit-IV: Membership of a Company

Definition of Membership – Members vs Shareholders – Modes of acquiring membership – Rights and liabilities of a member.

Unit-V: Management of a Company

Appointment, Remuneration of Directors – Duties and Powers of Directors – Liabilities of a Director – Removal of Directors – Retirement of Director – Legal Position of a Director.

Reference Books:
1) N.D.Kapoor, Company Law & Practice, Sultan Chand & Sons, New Delhi.
2) A.K.Mujumdar, Dr.D.K.Kapur, Company Law & Practice, Taxmann's, New Delhi.
3) N.D.Kapoor, Elements of Company Law, Sultan Chand & Sons, New Delhi.
4) Vijay Gupta, K.G.Garg, Company Law, Kalyani Publishers, New Delhi.
5) P.K.Ghosh, V.Balachandran, Company Law & Practice, Sultan Chand & Sons, New Delhi.

MODERN MARKETING
(Subject Code: U3CO4003)
(5 Hours)

Unit – I: Modern Marketing Concepts
Meaning and Definition - Evolution of Marketing - Features of Modern Marketing – Factors - Classification of Marketing - Modern Approaches of Marketing - Benefits of Modern Marketing.

Unit – II: Marketing Strategy and Planning
Meaning - Features of Planning - Market Planning – Benefits of Market Planning – Characteristics – Market Planning Process – Market Planning Activities – Long term and Short term.

Unit – III: Marketing Environment
Introduction - Importance of Environment Analysis – Need for Analysis – Concept of Micro and Macro Environment – Company's Suppliers – Intermediaries – Customers – Competitors – Public – Demographic Environment – Economic Environment – Physical Environment- Technological Environment – Political Environment - Legal Environment – Social and Cultural Environment.

Unit – IV: Sales Promotion
Meaning – Elements of Promotion Mix – Consumer Sales Promotion- Dealers Sales Promotion, Personal Selling- Importance – Steps in Selling- Advertising – Benefits of Advertising – Basic Features – Advertisement Media .

Unit – V : Recent Trends in Marketing
Telemarketing – Automatic Vending - E-Business – E-Commerce – E-mail – Internet – E-Auctioning – E-Marketing- E-Banking - E-Trading - Recent trend in marketing – Relationship marketing - CRM – Word of mouth Marketing - Test Marketing.

Reference Books:
1. Phillip Kotler, Principles of Marketing – Prentice Hall, New Delhi.
2. William J. Stanton, Fundamental of Marketing, Tata McGraw Hill, New Delhi.
3. Philip Kotler, Principles of Marketing, Prentice Hall, New Delhi.
4. Rajan Nair, Marketing – Sultan Chand & Sons.
5. R.S.N. Pillai, Modern Marketing – S.Chand and Company Ltd., New Delhi.

BUSINESS ENVIRONMENT
(Subject Code: U3CO4004)
(5 Hours)

UNIT-I : Introduction

Business Environment - Concept - Significance of Business Environment - Internal Environment - External environment - Micro and Macro environment - Process of Environmental Analysis – Importance- Limitations.

UNIT – II: Political Environment

Political Environment: The preamble to the Indian Constitution – Basic characteristics of Indian Constitution- Fundamental Rights- Fundamental Duties.

UNIT – III : Social and Cultural Environment

Social and Cultural Environment: Demographic Environment- Business and Society – Objectives – Economic Objective – Social Objective - Concept and Nature of Social Responsibility – Social Responsibility of business in India – Business Ethics – Nature, Elements levels of business ethics – Factors governing Business Ethics.

UNIT- IV : Economic Environment

Economic Environment: Meaning of Economic System – Characteristics – Functions of an Economic System- Types – Capitalism - Socialism - Mixed - Merits and Demerits – Economic planning in India – Five year planning.

UNIT – V :Legal Environment

Legal Environment: Classification of laws – Consumer Protection Act, 1986 – Objectives – Consumer Dispute Redressal Mechanism. SEBI Act, 1992 – Objectives – Process & Functions – SEBI Guidelines for Capital Issue.

Reference Books:

1. Francis Cherunilam, Business Environment, Himalaya Publishing House, New Delhi.
2. C.B.Gupta, Business Environment Sulthan Chand & Sons, New Delhi
3. S.Sankaran, Business Environment Margham Publication Chennai.
4. G.N.Pandey, Environment Management Vikas Publishing House (p) Ltd., New Delhi.
5. Shaikh Saleem, Business Environment, Kindersley India (P) ltd., New Delhi.

BUSINESS STATISTICS – II
(Subject Code: U3COAL 04)
(5 Hours)

Unit I: Correlation Analysis

Correlation – Definition – Uses – Correlation and Causation – Types – Methods of ascertaining Correlation – Scatter Diagram method – Graphical method – Karl Pearson's Coefficient – Rank Correlation – Concurrent Deviation method

Unit II: Regression Analysis

Regression Analysis – Meaning – Uses – Distinction between Correlation and Regression - Regression lines – Regression equations – Methods of obtaining Regression equations – Direct method – Deviations taken from Actual Mean – Deviations taken from Assumed mean – Standard Error of estimate.

Unit III: 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 – Chain Index Numbers – Base Shifting - Splicing.

Unit IV: Time Series

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 Cyclical and Seasonal Variations

Unit V: Transportation and Assignment Problems

Transportation Problems – Definition – North West Corner rule – Least Cost Method – Assignment Problems – Definition – Hungarian Assignment method – Restricted or Prohibited Assignments.

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

Reference Books:
1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi.
2. S.P. Gupta, P.K. Gupta and Manmohan, Business Statistics and Operations Research, Sultan Chand & Sons., New Delhi.
3. P.R. Vittal, Business Statistics and Operations Research, Margham Publications, Chennai.
4. R.S.N. Pillai and Bhagavathi, Statistics – Theory and Practice, S. Chand & Co. Ltd., New Delhi.
5. Manmohan, Kanti Swarup and P.K. Gupta, Operations Research, Sultan Chand & Sons, New Delhi.

PERSONALITY DEVELOPMENT
(Subject Code: U3COSB41)
Skill Based Paper – 3 Hours

Unit - I: Career Planning

Meaning and Importance – The Process of Career Planning – Different dimensions – Factors to be considered for Career Planning - Goal setting - Positive thinking.

Unit - II: Personality Development

Personality Development: Intra-personal skills - Inter-personal skills – Communication Skills – Spoken, Written, Non-verbal (Body language), Listening skills - Time management – Leadership – Creativity - Problem solving - Strategic planning.

Unit - III: Interview Preparation

Interview preparation: Art of facing interview - Resume preparation- Preparation for Campus Interviews - Pre-requisites for Campus Interviews - Stress and Anxiety Management - Dress Code & Appearance.

Unit – IV: Interview Process

Interview process: Written test - Group discussion – Role play- Response to oral questions - Employer's Criteria.

Unit - V: Workplace Success

Workplace success: First day on the job - Keeping your job- Planning your career – Moving ahead.

Reference Books:
1. Biswajit Das, Business Communication and Personality Development, Excel Books,
   New Delhi.
2. Subrahmanyam, et.al., Personality Development, Excel Books, New Delhi.
3. Wallace, Masters, Personality Development, India Edition- Cengage Learning.
4. Rajendra Pal, JS. Koralhalli, Essential of Business communication, Sultan Chand & Sons,
   New Delhi.

NON MAJOR II :BUSINESS CORRESPONDENCE

Subject Code: U3CONM41
Credit:2
Semester- IV
Hours:2

Objective:

To impart effective Communication Skills and gain knowledge about business letters

Unit –I : Introduction

Business Correspondence – Meaning- Objectives- Essential of effective Business Correspondence – Barriers to Communication

Unit – II : Business letters

Meaning – Need of a Business letter – Function of a Business letter – kinds of a Business letter.

Unit – III: Enquires

Meaning – Offer & Replies - Quotations & Prime Enquiry – Execution of order letters

Unit – IV: Collections letters

Meaning – Essential features of effective collection letter – collection series – Replies of Debtors.

Unit – V : Complaints

Meaning – Causes of Complaints – Quality complaints – Quantity Complaints – Non Delivery of Goods & Delay in execution of orders.

Reference Books:

1. Ramesh and Pattanchetti, Business Communication – S. Chand & Co., New Delhi
2. Rajendra Pal & J.S. Korlahall, Essentials of Business Communication, Sultan Chand & Sons, New Delhi
3. Shirley Taylor, Communication for Business, Pearson Publicaiton, New Delhi.
4. Bovee Thill Schatzman 7th Edition, Business Communication Today, Pearson Publication, New Delhi.
5. N.S. Raghunathan and B.Samthanam, Business Communication, Margham Publications, Chennai.

ENGLISH POETRY
CORE COURSE-V
SEMESTER-III

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

UNIT-I & II

Merchant of Venice

UNIT-III & IV

Macbeth

UNIT-V

Sonnets (17&18)

THE HISTORY OF ENGLISH LITERATURE-II (1851-1950)

ALLIED-III

SEMESTER-III

UNIT-I (PROSE)

G.K. Chesterton

George Orwell

Thomas Carlyle

UNIT-II (POETRY)

Matthew Arnold

Alfred Lord Tennyson

Robert Browning

UNIT-III (POETRY)

W.B. Yeats

W.H. Auden

G.M. Hopkins

UNIT-IV (DRAMA)

T.S. Eliot

Samuel Beckett

G.B. Shaw

UNIT-V (NOVEL)

Charles Dickens

Thomas Hardy

James Joyce

SKILL BASED SUBJECT I
PAPER I
SKILLS FOR EMPLOYMENT I
SEMESTER-III

UNIT-I

An Introduction to Communication

Group Discussion

UNIT-II

Taking Interviews

UNIT -III

Oral Presentation Skills

UNIT-IV

Answering the Questions of the Superior(s)

UNIT-V

Listening to Reports and Customer Complaints

Job Application and Resume

NON-MAJOR ELECTIVE I
PAPER I
ENGLISH FOR COMMUNICATION
SEMESTER-III

UNIT-I

1. The importance of communication

1. 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

7. Delivery

8. Audience

Prescribed Reading:

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

AMERICAN LITERATURE-I
CORE COURSE-VII
SEMESTER-IV

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)

Tennesse Williams   -Glass Menagerie

Eugene O'Neill   - Thirst

UNIT-V (NOVEL)

Ernest Hemingway   -The Old Man and the Sea

THE HISTORY OF ENGLISH LANGUAGE
CORE COURSE-VIII
SEMESTER-IV

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

SOCIAL HISTORY OF ENGLAND
ALLIED-IV
SEMESTER-IV

UNIT-I (16th C)

The Reformation in England

Dissolution of the Monasteries

UNIT-II (17th C)

English Colonial Expansion

Coffee- House Life

UNIT-III (18th C)

Causes and Effects of Industrial Revolution

Agrarian Revolution

UNIT-IV (19th C)

Anti-Slavery Movement

The Influence of Science on Victorian England

UNIT-V (20th C)

Means of Communication

Education in the 20th Century

SKILL BASED SUBJECT II
PAPER II
SKILLS FOR EMPLOYMENT II
SEMESTER-IV

UNIT-I

Attitude for Employability

Making Business Presentations

UNIT-II

Negotiating

Answering Enquiries

UNIT-III

Presenting Data in Verbal and Non-Verbal modes

UNIT-IV

Reading and Replying to e-mails

Reading Reports and editing for presentation of data

UNIT-V

Brain-Storming and Consensus-making

Post-Interview follow-up

Prescribed Text:

"SKILLS FOR EMPLOYABILITY" – DR.K.S.Purushothaman & Dr.K.Revathi

NON-MAJOR ELECTIVE II
PAPER II
BUSINESS WRITING-ENGLISH
SEMESTER-IV

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

Prescribed Reading:

"ADVANCED BUSINESS WRITING" - DR. K.M.PRABU

SEMESTER III

Paper – V   **DIFFERENTIAL EQUATIONS**

Objectives: This course aims to provide logical skills in the formation of differential equations, to expose to different techniques of finding solutions to these equations and in addition stress is laid on the applications of these equations in geometrical and physical problems

UNIT – I : ORDINARY LINEAR DIFFERENTIAL EQUATIONS
Bernoulli Equations – Exact differential equations – Equations Reducible to Exact equation – Equations of the first order and higher degree – Equation solvable for *p*, Equations solvable for *x* and Equations solvable for *y* – Clairaut's equation.
(9 hours)

UNIT – II : ORDINARY LINEAR DIFFERENTIAL EQUATIONS (Contd . . .)
Method of Variation of parameters – Second order differential equation with constant coefficients for finding the P.I's of the form $e^{ax}V$, where *V* is sin*mx* or cos*mx* and x^n.

(9 hours)

UNIT – III : ORDINARY LINEAR DIFFERENTIAL EQUATIONS (Contd . . .)
Equations reducible to linear equation with constant coefficients Cauchy's homogeneous linear equation – Legendre's linear equations – Linear dependence of solutions – Simultaneous equations with constants coefficients – Equation of the form $\frac{d^2y}{dx^2} = f(x)$ – Equation of the form $\frac{d^2y}{dx^2} = f(y)$.
(9 hours)

UNIT – IV : DIFFERENTIAL EQUATIONS OF OTHER TYPES
Equations which do not contain *y* – Equations which do not contain *x* – Equation whose one solution is known – Equation which can be solved by changing the independent variable – Total differential equation – Simultaneous total Differential equations – Equation of the form $\frac{dx}{p} = \frac{dy}{Q} = \frac{dz}{R}$ – Method of grouping.
(9 hours)

UNIT – V : PARTIAL DIFFERENTIAL EQUATIONS
Formation of a PDE – Complete Integral – Particular Integral – Singular Integral, Equations Solvable by direct Integration – Linear equations of the first order – Non-linear equations of the first order – Types : $f(p, q) = 0$, $f(x, p, q) = 0$, $f(y, p, q)=0$, $f(z, p, q) = 0$, $f(x, q) = f(y, p)$, $z = px + qy + f(p, q)$.
(9 hours)

RECOMMENDED TEXT:

1. HIGHER ENGINEERING MATHEMATICS, *B. S. Grewal,* (2002), Khanna Publishers, New Delhi.
2. DIFFERENTIAL EQUATIONS, *Sheply L. Ross,* (1984), III Edition John Wiley & Son,   New York.

REFERENCES:

1. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS, *M. D. Raisinghania,* (2001), S. Chand & Co., New Delhi.
2. ADVANCED MATHEMATICS FOR ENGINEERS AND SCIENTISTS, *M. R. Spiegel,*   (2005), Tata McGraw Hill Edition, New Delhi.
3. LAPLACE TRANSFORMS, *M. R. Spiegel,* (2005), Tata McGraw Hill Edition, New Delhi.

PAPER VI   **VECTOR ANALYSIS**

Objectives: This course covers the topics in vector and tensor calculus which are essential tools of modern applied mathematics. To develop deep understanding of key concepts followed by problems of applied nature.

UNIT – I : DIFFERENTIAL VECTOR CALCULUS

Differentiation of a Vector Geometrical Interpretation of the Derivative – Differentiation Formulae – Differentiation of dot and Cross products – Partial Derivatives of Vectors – Differentials of Vectors – Definition of Del.

(9 hours)

UNIT – II : GRADIENT, DIVERGENCE AND CURL

Definition of gradient, divergent and curl – Their physical interpretation – Directional derivative.

(9 hours)

UNIT – III : VECTOR IDENTITIES

Vector identities – Simple problems – Solenoidal and Irrotational.

(9 hours)

UNIT IV : VECTOR INTEGRATION

The Line Integral – Surface Integral, Volume integral its Physical Meaning.

(9 hours)

UNIT V : APPLICATIONS

Statements of Gauss, Stoke's and Green's Theorem (without proof).

(9 hours)

RECOMMENDED TEXT:

HIGHERENGINEERINGMATHEMATICS, *B. S. Grewal,* (2002), Khanna Publishers, New Delhi.

REFERENCES:

1. CALCULUS AND ANALYTIC GEOMETRY, *G. B. Thomas and R. L. Finney*, (1998), Addison Wesley (9ᵗʰEdn), Mass. (Indian Print).
2. ENGINEERING MATHEMATICS, *M. K. Venkataraman,* (1992), Part B. National Publishing Company, Chennai.
3. VECTOR CALCULUS, FOURIER SERIES AND FOURIER TRANSFORM, *P. R. Vittal,* (2004), Margham Publications, Chennai.

Allied Paper III   MATHEMATICAL STATISTICS – I

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.
Chapter 4 : Sections 4.5.1, 4.5.2, 4.6.1 - 4.6.3, 4.7.1 – 4.7.5, 4.9.
(15 hours)

UNIT–II
Random variables (Discrete and continuous) – Distribution function – Expectation and Moments – Moment Generating function – Probability generating function – Cumulant generating function.
Chapter 5 : Sections 5.1, 5.2, 5.2.1, 5.3, 5.3.1, 5.3.2, 5.4, 5.4.1, 5.4.3.
Chapter 6 : Sections 6.1 – 6.3, 6.10, 6.11, 6.17.
(15 hours)

UNIT–III
Characteristic function – Properties – Uniqueness and inversion theorem (Statement only) Chebychev's inequality.
Chapter 6 : Sections 6.12, 6.12.1, 6.12.2, 6.13.
(15 hours)

UNIT– IV
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.
(15 hours)

UNIT– V
Standard distributions: Discrete distributions – Binomial, Poisson – Continuous distributions– Normal, Uniform, Exponential, Gamma and Beta 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.
(15 hours)

CONTENT AND TREATMENT AS IN:

FUNDAMENTALS OF MATHEMATICAL STATISTICS, *S. C. Gupta and V. K. Kapoor,* 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 STATICS, *A. M. Mood, G. A. Graybil and D. G. Boes,* (1974), McGraw Hill.
3. ELEMENTARY STATISTICAL ANALYSIS,*S. S. Wilks,* Oxford and IBH.

Allied Pratical   **MATHEMATICAL STATISTICS   I**

1. Measures and Dispersion (absolute and relative)
2. Computation of Correlation Coefficient for raw and Grouped data, Rank Correlation Coefficient
3. Computation of Regression Equation for Raw and Grouped Data.
4. Curve Fitting by the Method of Least Squares
    a) $y = a x + b.$
    b) $y = a x^2 + b x + c.$
    c) $y = ae^{bx}.$
    d) $y = a x^b.$
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.

REFERENCES:

1. INTRODUCTION TO MATHEMATICAL STATISTICS,*R. V. Hogg and A. T. Craig,* (1998), Macmillan.
2. INTRODUCTION TO THEORY OF STATICS, *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.

SKILL BASED SUBJECT – I

MATHEMATICAL AUTOMATION PRACTICALS - I

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

NON–MAJOR ELECTIVE– I

Paper I   **BASIC MATHEMATICS**

Objectives: To introduce a few basic and elementary concepts of mathematics for other major students.

UNIT –I : SETS
Definition – Subsets – Power sets – Equality of sets – Finite and infinite sets – Set operations – Operations – De Morgan's Laws – Distributive tables – Cartesian products.   (6 hours)

UNIT –II : FUNCTIONS
Basic definitions – One to one and Onto, bijective, inverse functions – Composition of functions – Properties of functions.
(6 hours)

UNIT– III : SYMBOLIC LOGICS
Logic statements – Connectives – Truth table – Tautologies – Induction – Binary operations – Groups – Semigroups(Problems and simple properties only).   (6 hours)

UNIT – IV : MATRICES
Definitions – Types of matrices – Operations on matrices – Adjoint and inverse upto (2×2) matrices – Applications – Solving non homogeneous equations.   (6 hours)

UNIT – V : DETERMINANTS
Definition – Properties (without proof) – Application of determinants – Cramer's rule for the solution of a system of equations.
(6 hours)

CONTENT AND TREATMENT AS IN:

1. DISCRETE MATHEMATICS AND STRUCTERS, *Dr. M.K. Venkataraman& others,* The National Publishing company, Madras.

REFERENCE BOOKS:

1. ALGEBRA, ANALYTICAL GEOMETRY AND TRIGONOMETRY, *P. R. Vittal,* Margham Publication, Chennai.
2. DISCRETE MATHEMATICS, *Richard Johnsonbaugh,*(2002), Fifth Edition, Pearson Education Asia, New Delhi.
3. DISRETE MATHEMATICS STRUCTERS WITH APPLICATION TO COMPUTER SCIENCE, *J. P. Trembly and R. Manohar,* (2003), Tata McGraw – Hill. Pub., Co., Ltd, New Delhi.

PAPER VII   **SPECIAL TRANSFORMS – I**

Objectives: To introduce the concepts of Laplace transforms and use them to solve differential equations.

UNIT– I : LAPLACE TRANSFORMS
Introduction – Definition – Conditions for existence – Transforms of elementary functions – Properties of Laplace transforms – Simple Problems.
        (9 hours)

UNIT– II : LAPLACE TRANSFORMS (Contd . . .)
Transforms of Periodic functions – Transforms of Derivatives – Transforms of integrals – Multiplication by t^n – Division by t – Simple problems.
(9 hours)

UNIT–III : INVERSE LAPLACE TRANSFORMS
Inverse Laplace Transforms – Methods of Partial Functions.
(9 hours)

UNIT–IV : INVERSE LAPLACE TRANSFORMS (Contd . . .)
Other methods – Shifting property of finding inverse Laplace Transforms.
(9 hours)

UNIT–V : APPLICATION TO DIFFERENTIAL EQUATIONS
Solving Linear Differential equations with constant coefficients – Solving Simultaneous Linear Differential equations with constant coefficients using Laplace Transforms.   (9 hours)

CONTENT AND TREATMENT AS IN:

HIGHER ENGINEERING MATHEMATICS, *Dr. B. S. Grewal*, 40th Edition.

REFERENCE:

LAPLACE AND FOURIER TRANSFORMS, *Goyal Gupta,* Pragati Edition.

PAPER VIII **SPECIAL TRANSFORMS–II**

Objectives: To introduce the concepts of Fourier transforms and Z-transforms.

UNIT–I : FOURIER TRANSFORMS
Introduction–Definition–Fourier integrals– Fourier transforms–Fourier Sine and Cosine transforms–Properties of Fourier transforms.
(9 hours)

UNIT–II : FOURIER TRANSFORMS (Contd . . .)
Parseval's identity for Fourier transforms – Relation between Fourier and Laplace Transforms.

(9 hours)

UNIT–III : Z – TRANSFORMS
Definition – Some standard Z transforms – Linearity property –Damping rule – Some standard results.
(9 hours)

UNIT–IV : Z – TRANSFORMS (Contd . . .)
Shifting U_n to right & to left – Multiplication by n – Two basic theorems.
(9 hours)

UNIT–V : INVERSE Z – TRANSFORMS
Inverse Z transforms – Evaluation of Z transforms.
(9 hours)

CONTENT AND TREATMENT AS IN:

HIGHER ENGINEERING MATHEMATICS, *Dr. B. S. Grewal*, 40th Edition.

REFERENCE:

TRANSFORMS &PARTIAL DIFFERENTIAL EQUATIONS, *Balaji.*

ALLIED PAPER   IV   MATHEMATICAL STATISTICS II

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.
(15 hours)

UNIT –II
Test of significance – Large sample test for proportion, mean and standard deviation – Exact test based onStudents *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.
(15 hours)

UNIT –III
Point Estimation – Concept of unbiasedness, consistency, efficiency and suffiency – Cramer – Rao inequality – methods of Estimation – maximum likelihood Estimation – Method of moments.
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.
(15 hours)

UNIT –IV
Test of Hypothesis: Null and alternate Hypothesis – Type I and Type II error – Power of the test – Neymann Pearson lemma – Likelihood Ratio Test – Concept of Most Powerful test   (Statement and Results only).
Chapter 16 : Sections 16.2.2, 16.2.3, 16.2.5, 16.2.7, 16.4.7, 16.5, 16.6.
(15 hours)

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).*
(15 hours)

CONTENT AND TREATMENT AS IN:

1. FUNDAMENTALS OF MATHEMATICAL STATISTICS, *S. C. Gupta and V. K. Kapoor,* 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 STATICS, *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.

ALLIED PRATICAL   MATHEMATICAL STATISTICS   II

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 t and Chi square and F distribution
5. Problem based on ANOVA one way and two way classification
6. Completely Randomized Design
7. Randomized Block Design
8. 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 STATICS, *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.

SKILL BASED SUBJECT – II

PAPER – II   STRUCTURE THEORY

Objectives: To introduce the concept of Mathematical structures.

UNIT–I : LOGIC
Introduction – Equivalince Formulae – Tautological implications – Normal forms.
Sections 1.1 to 1.4.
(9 hours)

UNIT–II : LOGIC (Contd . . .) AND COMBINATORICS
Inference theory – Polynomial Expression – Discrete functions.
Sections 1.5, 2.1, 2.2.
(9 hours)

UNIT–III : COMBINATORICS
Recurrence Relations – Applications of recurrence relations – Generating Functions – Properties.
Sections 2.3 to 2.5.
(9 hours)

UNIT–IV : COMBINATORICS (Contd . . .)
Solutions of recurrence relations using generating functions – Mathematical induction.
Sections 2.6, 2.7.
(9 hours)

UNIT– V : COMBINATORICS (Contd . . .)
Extended Pigeon hole priniciple – Inclusion and exclusion priniciple.
Sections 2.7.
(9 hours)

CONTENT AND TREATMENT AS IN:

DISCRETE MATHEMATICS, *Prof. V. Sundaresan, K. S. Ganapthy Subramanian and K. Ganesan.*

BOOKS FOR REFERENCE:
1. DISCRETE MATHEMATICS ELEMENTARY AND BEYOND, *Lovasz Pelikan and Vestergombi.*
2. DISCRETE MATHEMATICS, *Dr. M. K. Venkataraman, Dr. N. Sridharan and N. Chandrasekaran.*
3. ATEXTBOOK OF DISCRETE MATHEMATICS, *Swapankumar Sarkar,* S. Chand & Co. Ltd.

NONMAJOR ELECTIVE – II

MATHEMATICAL AUTOMATION PRACTICAL II

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 XY scatter diagram, covariance, correlation coefficient, regression line.
- To plot both XY scatter diagram and regression lines.
- 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

CLASSICAL MECHANICS AND RELATIVITY

Paper Code:U3PY3001
Credits : 5
No. of hrs/wk : 4

Objective: *This paper aims to impart the understanding of mechanics and their applications of different systems and also to impart the knowledge 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*

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

UNIT- III

Hamiltonian formulation of classical mechanics – phase space – Hamiltonian function – Hamilton's canonical equations of motion

Applications of Hamilton's equations of motion - Simple pendulum - Compound pendulum – linear harmonic oscillator.

Relativity*

UNIT- IV

Introduction- Frames of references- Newtonian relativity – Galielan transformation equation – Ether hypothesis-Michelson-Morley experiment – significance of negative result – postulates of special theory of relativity.

UNIT -V

Lorentz transformation equations – Length contraction – Time dilation –space time diagram– Global Positioning System, Relativity of simultaneity – Law of addition of velocities – variation of mass with velocity – relativistic kinetic energy equations – postulates of general theory of relativity – gravitational red shift- particle wave duality- photons and gravitons.

Books for study:

1. Mechanics and mathematical methods by R Murugeshan, S Chand & Co. Pvt. Ltd., NewDelhi, 1990

2. Elements of mechanics by Gupta

3. Dynamics by Naranamurthi, National Publishing company, Chennai.

4. Classical Mechanics by Gupta Kumar and Sharma,

5. Classical Mechanics by B D Gupta and SathyaPrakash, KedarNath Ram Nath& Co.,

Books for Reference:

1. Mechanics by D S Mathur

2. Classical Mechanics by Goldstein, Narosa

*Note: Compulsory problem from UNIT II and IV in section B

SEMESTER III – SKILL BASED SUBJECT PAPER - I

ELECTRICAL & ELECTRONIC INSTRUMENTATION

Paper Code:U3PYSB31

Credits : 3

No. of hrs/wk : 3

Objective: *This paper aims to create the awareness in electrical and electronic instrument usage and to develop the skill to measure its outputs.*

UNIT-I

Electrical safety – Effect of electric shock - Ohm's law - Kirchhoff's laws – Laws of resistance – DC current – AC current - Neutral and earth conductor - Three phase AC fundamentals - Star and delta connection – Continuity testing - Switch – Types of Switches - Fuses - Circuit Breaker – Transformer and Classification of transformers

UNIT-II

Resistors – Classification of resistors – Colour code resistance designation – Inductors – Types of Inductors - Capacitors – Classification of Capacitors – Half wave rectifier - Full wave rectifier - Bridge rectifier - Zener diode voltage regulator - IC voltage regulators – Fixed positive and Negative Linear Voltage regulator

UNIT-III

Ohmmeter – Megohmmeter - Earth resistance tester – MC Voltmeter – MC Ammeter – Analog multimeter – Digital multimeter - Construction and operation of simple relay- Types of relay - Single phase wattmeter –Three phase wattmeter – Errors in energy meters - Automatic voltage stabilizers - Servo controlled voltage stabilizers

UNIT-IV

Digital voltmeter - Digital multimeter - Function generator - Block diagram and Principle of operation of CRO – Instrumentation amplifier using OP-AMP – Frequency counter - Lamp dimmer /fan motor speed regulator using TRIAC and DIAC – Light sensitive switch with photoresistor and phototransistor

UNIT -V

House wiring - Joints in electrical conductors – Electrical wiring accessories - Earthling method and regulations – Systems and diagrams used in domestic house wiring instillation-Testing methods of domestic house wiring instillation –Main switch and distribution board

Books for study:

1. A Text book in applied electronics- R.S. Sedha, S.Chand company LTD. New Delhi
2. A Text book of Electrical Technology- AK Theraja, S Chand &Co, New Delhi
3. Electrician Trade Theory I Year -National Instructional Media Institute, Chennai.
4. Electrician Trade Theory 2nd Year -National Instructional Media Institute, Chennai.
5. Information Technology & Electronic system maintenance, Trade theory I year--National Instructional Media Institute, Chennai.
6. Measurements and Instrumentation – A.R Arangaraju, Tristar Publications, Trichy.
7. Electronic Mechanic & Mechanic Radio and TV -National Instructional Media Institute, Chennai
8. Basic electronic-Repair & Maintenance of Power supply, Inverter & UPS, National Instructional Media Institute, Chennai.

Books for References:

1. Instrumentation and Measurement in Electrical Engineering – Roman Malaric, Brown   Walker press, New York.
2. Fundamentals of Electrical Engineering and Electronics – BL Theraja, S Chand &Co, New Delhi
3. Maintenance & Repair of Test Equipment-National Instructional Media Institute, Chennai.

LIST OF EXPERIMENTS

Paper Code:U3PYPR31
Credits : 3
No. of hrs/wk : 2

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 BH-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.

ALLIED PHYSICS

Paper Code:U3CSAL03

Credits : 4

No. of hrs/wk : 5

Objective: *This paper is offered to the students of mathematics, Chemistry and Computer Science as allied Subjects. 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

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

Specific heat – Callender's 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

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 and Acoustics of Building

Sound: Transverse vibration of strings – 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

Interference: Air Wedge –description - 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 – Polarimeter – Determination of specific rotatory power of a solution using the 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 –PRACTICAL I

ALLIED PRACTICAL

Paper Code:U3CSAP31

Credits : 2

No. of hrs/wk : 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 (All ten experiments compulsory)

1. Young's Modulus – Non-uniform bending method using Pin and Microscope.
2. Rigidity Modulus – Torsional oscillation method (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 prim (minimum deviation)
9. Potentiometer – calibration of low range voltmeter.
10. Determination of 'm & M' using Deflection magnetometer.

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 - NON MAJOR ELECTIVE PAPER I

FUNDAMENTAL OF ELECTRICAL AND ELECTRONIC

MEASUREMENTS

Paper Code:
Credits : 2
No. of hrs/wk : 2

Objective: *This paper aims to create the awareness in electrical and electronic instrument usage and to develop the skill to measure its outputs for non physics students.*

UNIT-I

Electric charge- electromotive force - current- voltage- power - Ohm's law - Kirchhoff's laws - AC supply - DC supply-phase, neutral and earth points-Three phase AC fundamentals, tester, watt-hour-meter.

Electronic Mechanic and Mechanic Radio and Television-IST Year (58-62), Electrician trade theory IST Year (256).

UNIT-II

Resistors-unit-values-coding schemes- Resistors, Capacitors Inductors types and **UNIT** - Transformer and transformer types

Electrician trade theory IST Year (84-88,186-187,221-252).

UNIT-III

Semiconductor diode – Light Emitting diode, Zener diode – Zener diode voltage regulator –- Transistors and circuit configurations

Electrician trade theory (253-283,294-297,300-303).

UNIT- IV

Principle, construction and working of a Multimeter , comparison of analog and digital - Principle of operation Relay- Battery charger- Emergency light circuits

Electrician trade theory IST Year (251-255)

UNIT-V

Tungsten filament lamp - Fluorescent lamp - low voltage lamps (CFL) – Flasher - Mercury vapour lamp - Sodium vapour lamp -Neon sign lamp

Electrician trade theory IST Year (294)

Books for study:

1 *Electronic Mechanic and Mechanic Radio and Television-I*ST *Year* . National Instructional

   Media Institute, Chennai.

2. *Electrician trade theory I*ST *Year.* National Instructional Media Institute, Chennai.

3. A Text book in Electrical Technology -BL Theraja, and -AKTheraja S Chand &Co, New Delhi
4. Maintenance & Repair of Test Equipment-National Instructional Media Institute, Chennai.

Books for References:

5. Instrumentation and Measurement in Electrical Engineering – Roman Malaric, Brown   Walker press, New York.

6. Fundamentals of Electrical Engineering and Electronics – BL Theraja, S Chand & Co.
7. Maintenance & Repair of Test Equipment-National Instructional Media Institute, Chennai.

OPTICS

Paper Code:U3PY4001
Credits : 5
No. of hrs/wk : 4

Objectives:

To make the students understand the dual nature of light through Geometrical and Physical Optics.
To introduce to them an important application of interference, diffraction and polarization in 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 – dispersion - Direct vision spectroscope-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.

UNIT- III: Interference*

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 – refractive index of gases – Jamin's and Rayleigh's interferometers.

UNIT- IV: Diffraction

Fresnel's explanation of rectilinear propagation of light – Zone plate – diffraction at circular aperture, straight edge – Fraunhofer diffraction at single and double slits – Plane diffraction grating –Theory- Determination of wavelength – Dispersive power of grating – Difference between prism and grating – Resolving power of a telescope, microscope, prism and grating.

UNIT-V: Polarization*

Nicol prism as a polarizer and analyzer – Huygen's explanation of double refraction in uniaxial crystals – Quarter and half wave plates – 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 Murugeshan. - 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. Ist 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 V in section B

MAINTENANCE AND SERVICING OF HOME APPLIANCES

Paper Code:U3PYSB41
Credits : 3
No. of hrs/wk : 3

Objective: *This paper aims to impart the awareness about safety, practical knowledge in maintenance and repair of electrical and electronic instrument*

UNIT-I

Battery for Inverter – Battery types – Checking battery acid level – Power supply for Battery charger - Principle of inverter – Inverter circuit – overload cut-off – Inverter Installation - UPS circuit – UPS installation – Calculation of power consumption – Testing of UPS – Common faults and Troubleshooting

UNIT-II

Automatic electric iron – Bimetal and adjustable Thermostats – Troubleshooting in an automatic iron – Ceiling fan – Construction – Regulator – General faults and remedy – Table fan –Construction – Servicing – Fluorescent lamps – Construction - circuit diagram - Ballast – Electronic Ballast - Compact fluorescent lamp (CFL) – Hair dryers – troubleshooting chart –Food mixer- Maintenance and servicing of a food mixer

UNIT - III

Semi-Automatic Washing Machine – Principle – Types - Control panel – Motor assembly – Various parts of wash tub – Washing machine wiring – Trouble shooting of Semi-Automatic Washing Machine – Microwave oven – Principle – Working – Various parts of Microwave oven – Microwave Maintenance – Trouble shooting of Microwave oven – VCD player – Principle – Block diagram – Working – General Troubleshooting

UNIT -IV

SMPS Power supply of Personal computers – Power supply outputs –Troubleshooting – Personal computers – Various parts of Central processing **UNIT** - Monitor – Key board – Mouse – Computer cables – Printers - Cellular Phone Basics-Cell Phone components- Cell Phone battery charger-Subscriber Identity Module (SIM) - Cell Phone Display – Blue tooth – Cell phone Memory- Wi fi.

UNIT – V

Refrigerator – Principle –Various parts of a refrigerator - working – circuit diagram – Common fault findings – Air-condition – principle - working – circuit diagram – Troubleshooting – Electric Water heater – Storage and solar type – Wet grinder – circuit – working – Troubleshooting.

Books for study

1. Repair of Home Appliance, National Instructional Media Institute, Chennai, CIT Campus , Chennai 600 032
2. Repair & Maintenance of Washing Machine and Micro Oven, National Instructional Media Institute, Chennai, CIT Campus , Chennai 600 032
3. Basic Electronics- Repair & Maintenance of power supply, Inverter & UPS, National Instructional Media Institute, Chennai, CIT Campus , Chennai 600 032

Book for Reference

1. Modern Power Inverter, compiled by Manahar Loti, BPB Puplications, New Delhi.

2. Uninterrupted power supply, compiled by Manahar Loti , BPB Puplications, New Delhi

IV SEMESTER – PRACTICAL IV

LIST OF EXPERIMENTS

Paper Code:U3PYPR41
Credits : 3
No. of hrs/wk : 2

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. Figure of Merit –Ballistic Galvanometer.

ALLIED PHYSICS

Paper Code:U3CSAL04

Credits : 4

No. of hrs/wk : 5

Objective: *This paper is offered to the students of mathematics, Chemistry and Computer Science as allied Subjects. 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

Atom model - vector Atom model- electron spin and spatial quantization - quantum numbers - Pauli's exclusion principle - excitation and ionization potentials- experimental determination-Franck and Hertz method

UNIT- II: Nuclear Physics

Particle Accelerator- Linear accelerator, cyclotron – Particle detectors – GM counter – Transmutation – Types – The 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

Faraday's laws of electromagnetic induction - vector form – Lenz's law – self and mutual inductance – Determination of coefficient of self inductance – Rayleigh's method – Growth and Decay of current in LR circuit – Growth and Decay of charge in RC circuit.

UNIT- IV: Crystallography and Fiber Optics

Types of Solids - Crystalline and amorphous - Crystalline matter - Periodic Array of Atoms - The crystal structure - unit cell - Miller indices – Bragg's law- Principle and Derivation- Types of bonding in crystal.

Principle and propagation of light within the fiber - classification of optical fiber - fiber optic communication system block diagram.

UNIT- V: Electronics

Basic Electronics: Junction Diode - LED - Zener diode - voltage regulator - Junction 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. Murugeshan 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 – PRACTICAL II

ALLIED PRACTICAL

Paper Code:U3CSAP41

Credits : 2

No. of hrs/wk : 2

Objective: *It is aimed at exposing the Allied students to the technique of handling simple measuring instruments and also make them measure certain mechanical and thermal properties of matter*

List of Experiments (All ten experiments compulsory)

1. Young's Modulus – Non-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. Characteristics of junction diode

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)

MAINTENANCE OF HOME APPLIANCES

Paper Code:U3MSNM41

Credits : 2

No. of hrs/wk : 2

Objective: *This paper aims to impart the awareness about safety, practical knowledge of house wiring, and understanding of working, maintenance and repair of electrical and electronic instrument for non physics students.*

UNIT-I

Electric shock, Electrical safety – First aid and its tools, House wiring -Earthling method and regulations - Main switch and distribution board – Fuses - Circuit breaker - Systems and diagrams used in domestic house wiring instillation.

Electronic Mechanic and Mechanic Radio and Television-IST Year (1-16),

UNIT-II

Electronic choke for fluorescent tube light – Electronic fan regulator –Dimmer, Low voltage power supply – IC regulated power supply.

Electrician trade theory IST Year (252-284). Electronic Mechanic Trade Theory-2nd Year (132),

UNIT-III

Automatic electric iron - Electric kettle - Water heater -Ceiling fan - Washing machine- - Microwave oven – Wet Grinder – UPS- Inverter.

Repair and maintenance of washing machine and microwave oven (40-56).Information technology and Electronic system maintenance Trade Theory II Year(348-365)

Repair and maintenance of Domestic Applications(40-43

Basic Electronics Repair and maintenance of power supply Inverter Ups(80-82)

UNIT-IV

Simple block diagram of Television receiver- Types of Television –Black and White,Colour,LED,LCD,Plasma and Smart T.V., Common fault finding, Yagi antenna - Dish antenna -Set Top Box.

Repair and maintenance of Telivision

UNIT-V

Cellular Phone Basics - Cell Phone components - Cell Phone Display -Cell Phone battery charger - Subscriber Identity Module (SIM) – CDMA, GSM, Bluetooth, Internet, modem, wi-fi,

Repair and maintenance of Cellphone

Books for study:

1. Electronic Mechanic and Mechanic Radio and Television-IST Year
2. Electrician trade theory IST Year.
3. Electronic Mechanic Trade Theory-2nd Year.
4. Repair and maintenance of washing machine and microwave oven)
5. Information technology and Electronic system maintenance Trade Theory II Year
6. Electrician Trade Theory-National Instructional Media Institute, Chennai.
7. Maintenance & Repair of Test Equipment-National Instructional Media Institute, Chennai.
8. Electronic Mechanic & Mechanic Radio and TV -National Instructional Media Institute, Chennai.

Books for References:

1. Hand book of Practical Electronic Circuits, Lenk: John D., Prentice HallInc., 1982.
2. Electrical & Electronic Measurements – A.K Sawhney, Khanna Publication, New Delhi
3. Measurements and Instruments- A.R. Arangaraju & TR Thayalan, Khanna Publication,
     New Delhi
4. Electronic and Instrumentation, S.M, Dhair, Khanna Publication, New Delhi
5. Modern Electronic Instrumentation and Measurements Techniques- Albert D. Helfrick &
     Willium D. Cooper, Prentice Hall of India private, Limited New delhi.
6. Applied Electronics –R.S Sedha , S Chand &Co, New Delhi

GENERAL CHEMISTRY III

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

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.

Semimicro techniques – Principles of acid-base equilibria – common ion effect – Solubility product and their applications in qualitative analysis.

Types of solvents – Physical properties of solvent – Protic and aprotic solvents – Amphi-protic / amphoteric solvent – aqueous and non-aqueous solvents – (Liquid ammonia and Liquid SO_2 as solvent).

UNIT-II

Aromaticity – Modern theory of aromaticity – Huckel's (4n+2) rule and its simple applications – Aromatic hydrocarbons – Resonance in benzene – Delocalised cloud in benzene.

Electrophilic reagents – Electrophilic substitution reactions in aromatic compounds – General mechanisms – nitration – halogenation – sulphonation – Friedel-Craft's acylation and alkylation.

Aliphatic nucleophilic substitutions – Nucleophilic reagents – Mechanism of SN1, SN2 and SNi reactions – effects of structure of substrate – solvent – nucleophile and Leaving groups.

UNIT-III

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.

Carnot's cycle – Efficiency – Carnot's theorem (Statement only) – Concept of entropy – Definition – Randomness and entropy – Numerical definition of entropy –

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

'p' block elements – Boron family – group discussion – anomalous behavior of Boron – diagonal relationship between B and Si – Electron deficiency and electron acceptor behaviour of Boron trihalides – bonding (hydrogen-bridge structure) in diborane.

Directive influence – Orientation – Ortho / para ratio – Nuclear and side chain Halogenations

Entropy changes in physical transformations – Calculation of entropy changes with Changes in T,V and P – entropy of mixing of ideal gases.

UNIT-V

Carbon family – Group discussion – catenation – Comparison of properties of carbon and silicon valencies – oxides – halides – hydrides and oxyacids.Classification – preparation – properties and uses of carbides.

Elimination reactions – Bimolecular elimination reaction (E2) – Unimolecular Elimination reaction (E1) – mechanisms of E1 and E2 reactions – Hoffmann and Saytzeff'srule – Cis and trans eliminations

Free energy and work function – Gibb's free energy – Helmholtz work function – Their variations with temperature – pressure and volume – Criteria 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.
  11. Inorganic Chemistry by R.D. Madan.

CORE PRACTICAL III

ANIONIC MIXTURE ANALYSIS AND PREPARATION

PAPER CODE: U3CHPR31

I ESTIMATION OF MIXTURE CONTAINING THREE ACID RADICALS

Analysis of mixture containing three anions of which one will be an interfering ion. Semi micro methods using the conventional scheme are to be adopted.

Anions to be studied

Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

II PREPARATION OF INORGANIC COMPOUNDS.

1. TetraammineCopper(II)sulphate
2. Tris(thiourea)Copper(I)chloride
3. Potassium trioxalatoferrate(II)
4. Chloropentammine cobalt(III)chloride
5. Ferrous ammoniumsulphate
6. Microcosmic salt

SCHEME

PREPARATION	15 Marks
RECORD	10 Marks
VIVA VOCE	10 Marks
PROCEDURE	10 Marks
ACID RADICALS	30 Marks
Total	**75 Marks**

REFERENCE BOOKS:

1. Basic priciples of Practical Chemistry – V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu

WATER TREATMENT AND ANALYSIS (30 hours)

PAPER CODE: U3CHSB31

OBJECTIVE:
To learn various methods of treatment and analysis of water

1UNIT I

Introduction – characteristics of water –alkalinty –hardness-Problems related to hardnessPurification of water for drinking purposes – potability of water – coagulation –electrochemical coagulation – sterilization and disinfection of water – aeration – ozonisation – chlorination

UNIT II

2.1 Softening methods: Clark's method –lime soda method, Permutit method orZeolite method – Ion exchange method – demineralization of water
2.2 Determination of Hardness ofwater – Titration method –complexometric method

UNIT III

3.1 Hard water and industries: Boiler feed water – Boiler corrosion – prevention of corrosion – scale and sludgeformation – internal and external treatment methods
3.2 Desalination of brackish water – electro dialysis –reverses osmosis – treatment of effluent from paper,fertilizer and petrochemical industries

UNIT IV:

4.1 Water analysis – sampling of water – chemical substances affecting potabilty– colour – turbidity, odour, taste, pH, temperature and conductivity
4.2 Analysis of solids present in water – suspended solids, dissolved solids, total acidity.

UNIT V

5.1   Analysis of chemical substances affecting health – NH_3, nitrate, nitrite, cyanide,sulphate, sulphide, chloride, fluoride – measurement of toxic chemical substances – analysis of chemical substances indicative of pollution – Dissolved Oxygen – BOD –COD

5.2 Bacteriological examination of water – Total count test – E.coli test – Physical examination of water – radio activity of water – methods of removing radioactivity from water.

REFERENCES:

1. Text book of Engineering chemistry by Kuriokose and Rajaram.
2. Industrial chemistry – B. K. Sharma – Goel Publishing house, Meerut
3. Water pollution and management – C. K. Varashne y – Wiley Eastern Ltd., Chennai.
4. Pollution control in Process Industries – S. P. Mahajan – Tata MecGraw Hill Publishing company Ltd., - NewDelhi.

III SEMESTER

CHEMISTRY IN EVERY DAY LIFE- I (30 hours)

NON MAJOR

PAPER CODE: U3CHNM31

OBJECTIVE:
To know about how chemistry is useful in Every Day life.

UNIT – I
1.1 General Survey of Chemicals used in everyday life.
1.2 Cosmetics: Talcum Powder, Tooth Pastes, Shampoos, Nail Polish, Perfumes, Soaps and Detergents – General formulations and preparation – possible hazards of cosmetics use.

UNIT – II
2.1 Food and Nutrition: Carbohydrates, Proteins, Fats, Minerals and Vitamins, definitions, sources and their physiological importance – balanced diet.
2.2 Adulterants in milk, ghee, oil, coffee powder, tea, asafoetida, chilli powder, pulses and turmeric powder – identification.

UNIT – III
3.1 Colour chemicals used in food-soft drinks – and its health hazards.
3.2 Chemicals in food production – fertilizers used in natural sources – Fertilizers urea, NPK and super phosphates need – user and hazards.

UNIT – IV
4.1 Plastics, Polythene, PVC, Bakelite, Polyesters, Resins and their applications
4.2 Natural Rubber – Synthetic rubbers – Vulcanization – definition and its application.

UNIT –V
5.1 Pharmaceutical drugs – Analgesics and Antipyretics – Antibiotics – definitions examples and applications.
5.2 Antiseptics – disinfect ants – definitions examples and application.
5.3 Explosives: Classification – Examples.

REFERENCES
1. Chemistry by Bahl&Arunbahl.
2. Analytical Chemistry by R. Gopalan.

PAPER IV

GENERAL CHEMISTRY IV (60 hours)

PAPER CODE: U3CH4001

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

'p' block elements – Nitrogen family – Comparative study of N,P,As,Sb and Bi – elements – oxides – oxyacids – halides and hydrides – valency states.

Oxygen family – Comparative study of O,S,Se and Te-elements-catenation –Oxides – halides – hydrides and oxy acids – anomalous behaviour of oxygen.

Oxy-acids of sulphur including Peroxy acids and Thionic acids.

UNIT-II

Aromatic nucleophilic substitutions – Unimolecular nucleophilic substitution – mechanism – Bimolecular nucleophilic substitution – mechanism.

Polyhydric alcohols – glycerol – Unsaturated alcohols – preparation – Properties and uses of allyl alcohol.

Phenols – acidic character of phenols – Kolbe's reaction – Reimer – TiemannReaction – Gattermann – Lederer – Manasse and Houben – Hoesh reactions.

UNIT-III

Gibbs-Helmholtz equations – derivation and applications.Clausius-clapeyron Derivation and Application.

Third law of thermodynamics – Entropy at absolute zero – Planck'sformulation of third law – Nernst heat theorem – statement of III law of thermodynamics.

Evaluation of absolute entropy from heat capacity measurements-exceptions to III law – application of III law.

UNIT-IV

Noble gases – Electronic configurations – Reasons for placing in zero group –position in the periodic table – Chemical inertness of noble gases – reasons –Applications – Clathrates.

Di and tri-hydric phenols – alpha and beta naphthols – preparation properties and uses.

Partial molar properties – Chemical potential – Gibbs-Duhem equationeffect of temperature and pressure on chemical potential – chemical potentialin systems of ideal gases.

UNIT-V

Compounds of xenon – hybridization and geometries of $XeF_2,$ XeF4,-$XeF_6$and $XeOF_4$.

Ring substitution in phenol – Mechanisms of esterification – nitration - Sulphonation – halogenation – coupling with diazonium salts.

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.

CORE PRACTICAL IV

INORGANIC QUALITATIVE ANALYSIS

PAPER CODE: U3CHPR41

Analysis of mixture containing two cations and two anions of which one will be an Interfering anion. Semi micro methods using the conventional scheme are to be adopted.

Cations to be analysed

Lead, Copper, Bismuth, Cadmium, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.

Anions to be analysed

Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

RECORD	10 Marks
VIVA VOCE	10 Marks
ACID RADICALS	20 Marks
BASIC RADICALS	35 Marks
Total	**75 Marks**

REFERENCE BOOKS:

1. Basic priciples of Practical Chemistry – V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu

FOOD CHEMISTRY AND NUTRITION

PAPER CODE: U3CHSB41

OBJECTIVE:
Candidates must apply knowledge gained from the food and nutrition syllabus that keep in mind factors such as personal/family needs and lifestyles, foodstuffs, and how diet relates to health

UNIT I:
Nutrition and nutrition related problems:diet, balanced diet, malnutrition, under-nutrition, over- nutrition, deficiency disease

Nutritive value of foods: The sources and functions of proteins (high biological and low biological value), carbohydrates (monosaccharide, disaccharide and polysaccharide) - fats - vitamins (A, D, C, B group – thiamin, riboflavin, nicotinic acid and B12) - mineral elements (calcium, phosphorous, iron, sodium chloride, iodine, fluorine)

UNIT II:
Composition and value of the main foods in the diet :milk, meat, fish, cheese, eggs, margarine and butter; cereals (wheat, rice, maize, millets, oats); fruits and vegetables (importance of pulses and nuts as inexpensive sources of protein, especially the soya bean because of its higher protein value).

UNIT III
Beverages : Definition and examples – classification of beverages- fruit based beverages – milk based beverages – non alcoholic based beverages and ill effects of alcoholic beverages.

Sources and functions of dietary fiber. .

UNIT IV
Dietary guidelines : Factors affecting food requirements - planning and serving of family meals. Meals for all ages.Special needs of - pregnant and lactating women - convalescents, - vegetarians.Meals for special occasions, festivals, packed meals, snacks (light refreshment), beverages.

Use of herbs, spices and garnishes.

UNIT V
Food spoilage, and hygiene in the handling and storage of food: Action of enzymes, bacteria, yeasts and moulds.

Food preservation : Reasons for preserving food. Methods of preservation and an understanding of the principles involved: heating – canning, bottling- removal of moisture – drying - reduction in temperature – freezing - chemical preservation – sugar (jam-making), salt, vinegar.

The processing of milk - use of enzymes and bacteria in the manufacture of cheese and yoghurt

REFERENCES :

1. Food science – III edition – B.Sri Lakshmi New Age International Publisher ,2005

2. Food chemistry – Lilian Hoagland Meyer CBS Publishers and distributors, 2004.

3. Fundamentals of Food and Nutrition – Mudambi, R. Sumathi, and Raja kopal, M.V – Wiley Eastern Ltd., Madras.

4. Handbook of Food and Nutrition – N. Swaminathan – The Bangalore Printing and Publishing Co., Ltd., Bangalore.

5. Food Science ,Nutrition and Health – Brian . A. Fox, Allan G. Cameron Edward Arnold, London.

CHEMISTRY IN EVERY DAY LIFE (2 hours)
Non Major Elective II

PAPER CODE: U3CHNM41

OBJECTIVES:

To make students acquainted with basics of Chemistry and its significance.

UNIT I
Principles of Chemistry
Basic Laws in Chemistry to include: Law of conservation of Energy, 2nd and 3rd laws of thermodynamics, Avagadro's law, Charles law, Boyles Law, Gay-Lussac's law, Van der Waals law, Le-Chatlier Braun Principle, Principle of electrical neutrality, Dalton's law of partial pressures, Theory of relativity and its significance.

UNIT II
Modern Chemistry
The need for modern theories of chemistry: Quantum Chemistry (outline). Modern states of matter to include bosons and fermions (outline) and modern sub atomic particles classification (Quarks). Basic Structure of atoms and molecules (Methane Ethane Acetylene, Benzene) explained using Hybridization Theory. Semi-conductors and band gaps explained on the basis of MO Theory. Organic Light Emitting Diodes and LCD's (outlines and examples).Technology and Society.

UNIT III
Atmospheric Chemistry
Chemical composition of atmosphere.Water Vapour content of atmosphere and its effect on climate (Dry weather and snowy weather).Atmospheric layers and their classification.Ozone and its significance.Thermosphere and its significance.Ionosphere and its significance.Stratosphere and its significance. Gases that pollute the atmosphere like CO, CO_2, Methane, CFC, SO_2, NO_2.

UNIT IV
Geochemistry and Petro-chemistry
Basic structure of the earth (Crust, Mantle and Core) and their Composition (Study of elements like O, Mg, Fe, Si, S in combined states).Lithosphere and Hydrosphere. Fossil Fuel - Hydrocarbons: Propane, Butane, Pentane, Paraffin, naphthalene and aromatics from Crude oil – brief outline about petroleum extraction, Octane Value, Unleaded Fuel,

UNIT V
Water Chemistry
Hard and Soft water Characterisitcs and determination of hardness of water.Methods to evaluate them.BOD and COD.Purification of water, Distillation technique and potability of water.Aeration and ozonisation of water. Reverse Osmosis. Conservation of Water - Rain water harvesting and methods to preserve water - role of trees.

Semester : 3	**Sub.Code : U3BT3001**
Hrs/ Week: 4	**Credit : 4**

Objective: Objective of the course is to focus on basic principles of different instruments & their application in Biotechnology.

UNIT I
Care & Maintenance of laboratory equipments – Balance, Hot plate & Magnetic stirrer, Incubator, Water bath, Photometers, Nephelometers, Manometer, Autoclave.

UNIT II
Biological containment system. Air sanitation procedure. Potential Hazards of Laboratory techniques. Light Microscopy: Simple & Compound Microscope, Phase contract Microscope, Electron Microscope (TEM/SEM) (Principle).

UNIT III
Centrifuge - Centripetal Force, Centrifugal force, basic principle of centrifugation, centrifuge type, types of rotor density gradient centrifugation, Nature of density gradient, preparative centrifugation, Differentials centrifugation & applications.

UNIT IV
Spectroscopy: General principle, Electromagnetic Spectrum, radiation energy & atomic structure, Types of Spectra & their biochemical usefulness. Basic law of absorption, Visible & Ultraviolet Spectroscopy, application in biology. Electrophoresis Apparatus.

UNIT V
Care & maintenance of laboratory Equipment- pH meter, distillation Plant, De-ionizers. Automatic dispensers & Diluters, Acid-base analyser, Osmometers.

REFERENCE BOOKS:

1. Biochemistry, Vote, D. & Vote, J.G. (1995), Second edn. John wiely &sons

2. Bioinstrumentation, John Webster, (2004). John weily & Sons.

3. Bioinstrumentation, Veerakumari(2006). First edn. MJP Publisher

4. Molecular Biology of the Gene, James, D.Watson Hopkins N.H. Robert, J.W & Steitz, J.A.

5. Biochemistry , Zubay, G.L. edition 4., WmC , Brown Pulshers

6. Analytical Biochemistry and separation techniques, Palanivelu, P (2008). Tulsi Books centere Madurai.

7. Principles of Biochemistry, Lehninger, Nelson, D. & Cox, M.(2000). Edition 4 W,H. Feeman and Company, New York.

8. Biophysics, Arora. (2004). Edition 1, Himalaya publishers, New Delhi.

9. Practical Biochemistry,Wilson, K.& Walker, J. 2003.edition 5, Cambridge University

PRACTICAL 3 : BIOINSTRUMENTATION

Semester : 3   **Sub.Code:U3BT PR 31**
Hrs/ Week: 3   **Credit : 3**

1. Study and Care of Microscope, Observation of Microscopic samples

2. Separation of Sub cellular Organelles

3. Study of UV-Visible Spectrophotometer

4. Separation of Paper Chromatography / TLC

5. Separation of pigments by column chromatography

7. Principles and working of different centrifuges.

8. UV Spectroscopic Analysis of DNA /Proteins

9. Study of Paper/ Agarose Gel Electrophoresis

References:

1. Practical Biochemistry- David Plummer- Tata McGraw Hill

2. Light Microscopy in Biology-A.J. Laccy.

3. Instrumental Methods of Chemical Analysis –B.K. Sharma-Goel.

Semester : 3	**Sub.Code : U3BTAL03**
Hrs/ Week: 3	**Credit : 3**

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. (1967) Statistics in Biology, Vol. I Mc Graw hill. New York.

2. Campbell R.C. (1974) Statistics for Biologists, Cambridge Univ, Press, Cambridge

3. Daniel (1999) Biostatistics (3rd edition) Panima Publishing, Compotation

4. Sward law,A.C.(1985) Practical Statistics for Exponents Biologists, John Wiley and Sons, In

5. Khan (1999) Fundamentals of Biostatistics Publishing corporation

6. Textbook of Biostatistics

ALLIED PRACTICAL 3 : BIOSTATISTICS

Semester : 3	**Sub.Code:U3BTAP03**
Hrs/ Week: 3	**Credit : 3**

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 Neam leaves / Fish

6. Correlation and Regression analysis

7. Computational exercise for Mark sheet preparation

8. Computer exercise for Graphical Tools – Line, Bar, Histogam, Pie diagram

Semester	**: III**	**Sub. Code**	**: U3BTSB301**
Hrs/Week	**: 3**	**Credit**	**: 3**

Objective: To focus on the basic principles pertaining to aquaculture & significance.

Unit –I : Introduction to aquaculture – history and scope – aquaculture in local, national and global scenario – cultivable fresh water, marine and ornamental species – Culture systems:Traditional, Extensive , Semi-intensive and intensive systems

Unit II :–Freshwater aquaculture – Introduction – monosex& poly culture,pokali culture, sewage fed fish culture, integrated fish farming – brackish water aquaculture – culture technique of carps

Unit III : Marine aquaculture –sea ranching – cage culture – raft culture – rope culture – pen culture - culture technique of shrimps

Unit IV : Ornamental fish keeping- Common characters and sexual dimorphism of Fresh water aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph and Butterfly fish – live feed organisms - General Aquarium maintenance

Unit V : Economic importance of aquaculture–economically important freshwater and marine organisms (fishes, crabs, oyster, shrimp, lobster, mussels) – Importance of Fishery products and by-products

Reference Books:

1. Anon, 1983. Advances in aquaculture and fisheries research: Report of a California Sea Grant Symposium, May 18 - 20 1983. California Sea Grant.

2. Barnabè, G. (Ed.) 1990. Aquaculture. Ellis Horwood. 2 Vols;

3. Jhingran V.G. 1985, fish & Fisheries of India, Hindustan publishing co. New Delhi

4. Mill Dick, 1993 : Aquarium Fish, DK Publ. Co. Inc. New York – USA.

5. RamasamySanthanam, N. Ramanathan, G. Jegatheesan. 1990. Coastal Aquaculture in India, CBS Publishers & Distributors, - Aquaculture -

6. S. Ayyappan, J. K. Jena, A. Gopalakrishnan, Dr. A. K. Pandey, Handbook of fisheries and aquaculture, Indian Council of Agricultural Research. Directorate of Information and Publications on Agriculture

7. S. P. Malhotra, S.P. Malhotra V.R.P. Sinha. 2007. Indian Fisheries and Aquaculture in a Globalizing Economy, Volume 1Narendra Publishing House, - Technology & Engineering

8. Santhanam,James Lee Burke,ChatterjeeDipankar. 2012. A Manual of Fresh Water Aquaculture. Publisher: Oxford University Press.

9. Shammi, Q.J. and Bhatnagar, S., 2002. Applied Fisheries: Agrobios (India)

10. Shanmugam K. 1992, Fishery Biology and Aqua culture-Leo Pathipagam – Chennai – India.

11. Yadav. 1995 : Fish and Fisheries, Daya Publ. Co., New Delhi – India

Non Major Subject- 1: Applied Biology 1

Semester : 3   **Sub. Code : U3BTNM32**

Hrs/Week : 2   **Credit** : 3

Objectives: to focus on economic importance and the applications of biological organisms.

Unit I : Vermiculture – Introduction – scope and importance. Types – Physicochemical characters of vermicomposting. Methods of vermicomposting, vermiwash, Applications of vermicomposting.

Unit II : Sericulture – Introduction – scope – Life cycle of silk moth. – Rearing of silk. Diseases of silkworm. – Moriculture and its applications.

Unit III : Aquaculture – Cultivable organisms (Freshwater, estuarine and marine) – Criteria to select cultivable organisms. – culture technique of common carp. – Design, construction and maintenance of Home aquaria. – Budget for small scale aquaculture unit.

Unit IV : Apiculture – Life cycle of Honey bee, Mouth parts, methods and preparation of honey hives, Medicinal importance of Honey.

Unit V : Mushroom Culture – Introduction and scope – types of mushroom – methods of mushroom culture and economic importance.

Reference books:

A textbook of Pisciculture and Aquarium Keeping (2009), H.S. Jagtap, Mukherjee and Garad, Daya publication House, Delhi.

Textbook of Economic Zoology , Verma and Agarwal.

CORE 4: IMMUNOLOGY

Semester: 04   **Subject Code: U3BT4001**

Hrs/ Week: 4   **Credit: 4**

Objectives: To focus the immunological principles, immunity with reference to human.

UNIT – 1:

History and scope of immunology – Immune system – Primary and secondary organs – Immuity – Innate and acquired 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. Monoclonal antibodies – Hybridoma technology and its applications.

UNIT – 4:

B-cells and Humoral immunity, B-cell activation and proliferation, Plasma cells and memory cells. Cell mediated immunity – T-cell activation. Role of T-helper and cytotoxic cells. Cell mediated immunity to bacteria, viruses, interleukins, interferons and lymphokines.

UNIT – 5:

Transplantation immunology – Autograft and allograft rejection. Hyper sensitivity reactions – Immune suppression in transplantation.Tumor Immunology and Auto immune diseases – Hamemolytic anaemia, Thrombocytopenia, Lupus eripthematosus – AIDS.

REFERENCES:

1. Immunology – Kuhy (2000)
2. Essential Immunology – Ivan Roitt (2007)
3. Immunology – An introduction – T. Zard (1995)

CORE PRACTICAL 3 : IMMUNOLOGY

Semester : 4   **Sub.Code:U3BTPR03**

Hrs/ Week: 3   **Credit : 3**

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

ALLIED - 4 : FOOD PROCESSING TECHNOLOGY

Semester : 4   **Sub.Code:U3BTAL04**
Hrs/ Week: 3   **Credit : 2**

Objective : To understand better the various technologies of food processing.

UNIT- 1

Scope and importance of food processing. Microbes in food industry – Quality enhancers, contaminants. Properties of food – Physical, thermal and mechanical. Raw material preparation – Cleaning, Sorting, Grading, Peeling.

UNIT-2

Processing Methods – Heating, Bleaching and Pausterization. Freezing - Dehydration – Canning – Additives – Fermentation – Extrusion Cooling – Hydrostatic pressure cooking – Direct heating – Microwave processing – Infra radiation processing – Concepts and equipment used.

UNIT – 3

Fruit and vegetable processing – Mango pulp processing – Tomato processing. Pickles and Sauerkraut technology. Mushroom processing. Onion processing. Vegetable juices and concentrated products. Sensory evaluation methods for fruits and vegetable products.

UNIT – 4

Manufacture of Dairy products – Buffer manufacture methods – Cheese manufacture methods. Ice cream manufacture oven run types of freezers. Banana processing – Guava processing – Papaya processing. Fruit beverage technology.

UNIT – 5

Quality control and food labeling - definition. Aspects of quality control – Quality control tools. Quality control chart – Quality factors in food – Nutrition labeling – Specification – Rules and regulations – Trade license and registration marks. Opportunities of food processing industries in Tamil Nadu.

REFERENCES

1. Introduction to food engineering, **_R. Paul Singh_** , _Academic Press.B - 2000_
2. Molecular approaches to improving Food quality and safety, **_Bhatnagar.D and Cleveland.T_** ,_Van Nostand Reinhold, New York - 1992_
3. Fruit and vegetable preservation- Principles and Practices, **_Sri Vastava R and Sanjeev Kumar_** _International Book Distributing Co - 1998_
4. Fruit and vegetable processing, **_Sumaa Bhatti, Uma varma_** ,_CBS Publishers_
5. Outlines of Dairy Technology ,**_De Sukumar,_** _Oxford University Press, New Delhi - 1999_

ALLIED PRACTICAL - 4 : FOOD PROCESSING TECHNOLOGY

Semester : 4
Sub.Code:U3BTAP04

Hrs/ Week: 3   **Credit : 2**

1. Tomato Processing

2. Mango Pulp Making

3. Mushroom Processing

4. Butter (Manufacture) Making

5. Ice-Cream (Manufacture) Making

6. Fruit Waxing

7. Fruit Beverage Technology

Skill Based Subject- 2: Human Pathology

Semester   : 4   Sub. Code   : U3BTSB402

Hrs/Week   : 3   Credit   : 3

Objectives:

Unit I : Normal Microbiota of Human body - relationship between normal microbiota and host – classification of infectious diseases – spread of infection – reservoirs – nosocomial infection – emerging infectious diseases

Unit II : Bacterial Diseases of respiratory (Dipththeria, Whooping cough and TB), digestive (Typhoid, Cholera and Gastroenteritis) and genitourinary tracts (Cystitis, Gonorrhea and Syphilis)

Unit III : Viral Diseases: AIDS, Polio, Chicken pox, measles, Rabies

Unit IV : Fungal Diseases: candidiasis, histoplasmosis, Pneumocystis, Cutaneous and sub-cutaneous mycoses

Unit V : Protozoan and Helminthes Diseases: Malaria, Elephantiasis, Amoebiosis

Reference books:

Tortora, 2003. An Introduction to Microbiology

Chand S, Introduction to Microbiology

Armugam N. 2011, Introduction to Microbiology, Saras Publications.

Pelczar, 2008, General Microbiology.

Non Major Subject- 2: Applied Biology 2

Semester : 4	**Sub. Code : U3BTNM412**
Hrs/Week : 2	**Credit** : 3

Objectives: to focus on economic importance and the applications of biological organisms.

Unit I : Biofertilizer – Agricultural benefits, Soil fertility, Nitrogen fixation and its importance - use of microbes – Azolla and Rhizobium – Azotobacter – Azospirillum and Blue Green Alage and Mass production of Biofertilizer and its applications.

Unit II : Herbal Knowledge – Basic Knowledge of Siddha, Ayur veda, Unani, Fruits(Dates, Watermelon), Vegetable leaves(Ocimum, Menthol), Nuts (Cashew, Almond), Flower (Sunflower), Seed (Olive, Fig)and Seed (Chickpea, Groundnut) and its various components (Vitamins and Mineral composition)

Unit III : Dairy Products – Starter – Fermented Milk – Curd – Butter Milk – Lassie – Butter – Ghee – Cheese. Fermentation methods.

Unit IV : Health care product – Important Hormones – insulin, Growth Hormon, Thyroid Hormone. Enzymes – Streptokinase, Urokinase and their role in Heartattack. Vaccines, Immunoglobulines and interferons.

Unit V : Waste water Treatment – Importance and scope. Industrial and Sewage water treatment. Process, Environmental significance.

Reference books:

Text book of Biofertilizer (2000),

Economic Zoology, verma (1998)

Biotechnology, (2000), Sathyanarayana

Biotechnology (2002), Arumugam, Saras publication

ALLIED PAPER III : ZOOLOGY I
(II BSC – CHEMISTRY AND BIOCHEMISTRY)

Semeter : III   **Sub. Code: U0CHAL03/ U0BIAL03**

Hrs/week: 04   **Credits : 3**

Objective:

To study the systematic and functional morphology of invertebrates and chordates.

UNIT 1

Structure and Life cycle -Phylum Protozoa – Entamoeba, Porifera -Sycon Coelenterata – Obelia. Platyhelminthes-Taenia solium.

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.

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
2. Chordate Zoology-   Verma and Agarwal – S. Chand Publishers
3. Invertebrate Zoology – Saras Publication
4. Chordate Zoology – Saras Publication
5. Comparative Chordate Zoology – Water man
6. Invertebrate Zoology – Nigam
7. Chordate Zoology - Nigam

ALLIED PAPER IV: ZOOLOGY II
(II BSC – CHEMISTRY AND BIOCHEMISTRY)

Semeter : IV   **Sub. Code: U0CHAL04/**
U0BIAL04
Hrs/week: 04   **Credits : 3**

Objective:

To understand task and principles of cell biology, Genetics, Developmental Biology, Physiology, Ecology and Evolution.

UNIT 1

Cell biology – Structure of animal cell- Genetics: Mendelian Principles, Molecular structure of genes – Genetic Engineering and its applications.

UNIT 2

Structure of Ovum and Sperm and physico-chemical properties,spermatogenesis,oogenesis, Fertilization – Cleavage and gastrulation of frog

UNIT 3

Human Physiology: Digestive and its disorder – Human brain, Kidney – Mechanism of urine formation and disorders.

UNIT 4

Pollution - Air pollution and water pollution and consequences. Atomic power plants – Safe gurarding Mechanism. Green house effect – Global warming- Acid rain.

UNIT 5

Evolution Theories – Lamarkism & Darwinism, Neo Lamarkism and Neo Darwinism.
Specieation-types.

Reference Books:

1. Cell Biology – De Robertis
2. Cell Biology – S.C. Rastogi, TATA MC Graw Hill Publishing Company, 1990
3. A Manual of Zoology, Part – I & II
4. Textbook of Vertebrate Embryology, NW. Majumdar
5. Animal Ecology and Distribution of Animals, Veera Bala, Rastogi.

ALLIED PRACTICALS III: ZOOLOGY
(II BSC – CHEMISTRY AND BIOCHEMISTRY)

Semeter:iii   **Sub. Code: U0CHPR03/**
U0BIPR03
Hrs/week: 04   **Credits : 3**

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
PORIFERA   - Sycon
COELENTERATA   - Obelia, Hydra
PLATYHELMINTHES   -Taenia Solium
ASCHELMINTHES -Ascaris – Male and Female
NEMATODA   -Earth Worm
MOLLUSCA   -Pila, Fresh Water Mussel
ARTHROPODA   -Prawn
ECHINODERMATA -Sea Star

2. Chordata
PROCHORDATA   -Balanoglosus
PISCES   -Shark, Cat Fish.
AMPHIBIA   -Frog
REPTILIA   -Calotes   Snakes-Cobra, Python
AVES   -Pigeon- Pigeon Quill Feather
MAMALLIA   -Rat.

Reference Books:
Practical Manual – Lab. Rastogi – Meerut
Practical Zoology – N. Armugam

ALLIED PRACTICALS IV: ZOOLOGY
(II BSC – CHEMISTRY AND BIOCHEMISTRY)

Semeter:4   **Sub. Code: U0CHPR04/**
U0BIPR04
Hrs/week: 04   **Credits : 3**

MODELS/SLIDES/SPOTTERS ONLY

CELL BIOLOGY:
      1.MITOSIS
      2.MEIOSIS
      3.ANIMAL CELL
      4.SQAMOUS EPITHELIUM
      5.GLANDULAR EPITHELIUM

GENETICS:
      1.DOMINANT AND RECESSIVE CHARECTERS- OBSERVATION IN HUMAN.

PHYSIOLOGY:(MODELS)
      1.HUMAN HEART.
      2.HUMAN KIDNEY.
      3.HUMAN BRAIN.
      4.OBSERVATION OF BLOOD PRESSURE –SPYGNOMONOMETER

EMBRYOLOGY:(SLIDES)
      1.SPERM.
      2.OVUM.
      3.CHICK EMBRYO   -24hours,48hours,72hours

ECOLOGY:
      1.RAIN GAUGE.
      2.PH PAPER-WATER SAMPLE
      3.ECOLOGICAL ADAPTION

EVOLUTION:
EVOLUTION OF HORSE.

FIELD VISIT:
ENVIRONMENTAL AWARENESS.

Reference Books:
      1.zoology practical manual.1&2
      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

III Semester

Paper - III

BIOPHYSICAL AND BIOCHEMICAL TECHNIQUES – I

Paper Code:	**4 Hrs /Week**
Credits: 4	**Total : 60 Hrs**

OBJECTIVES:
- ✓ To understand the principles and biological applications of various biochemical techniques.

UNIT- I:UNITS OF MEASUREMENT
    10hrs

Units of measurements of solutes in solution(Normality, Molality, Molarity, Ionic strength, Milli moles). Osmosis, Osmotic pressure, Osmolarity and its applications. Concept of isotonic, hyper and hypotonic solution and its importance in biology. Concept of pH, pOH, buffer, buffer capacity, Henderson – Hassel Balch equation and its importance. Buffers in body fluid- Bicarbonate, Phosphate and protein buffer.

UNIT- II: MEASUREMENT OF pH
    10hrs

Principle, instrumentation and applications of hydrogen electrode, glass electrode in determination of pH. Principle, instrumentation and applications of Clark oxygen electrode.

UNIT- III: ELECTROPHORESIS
    10hrs

Principles of electrophoresis, factor affecting electrophoretic mobility – sample, electric field, supporting medium, composition of buffer. Tiscelius moving boundary, paper, and cellulose acetateelectrophoresis.

UNIT- IV: APPLICATION OF ELECTROPHORESIS
10hrs

Sodium dodecyl sulphate poly acrylamide gel electrophoresis (SDS-PAGE) and its applications. Determination of molecular weight of protein by SDS-PAGE. Principle, procedure and applications of Agarose gel electrophoresis. Principle, methodology and applications of immuno electrophoresis.

UNIT- V: 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.

Biological hazards of radiation and safety measures in handling radio isotopes.

TEXTBOOKS:

1. Biophysical Chemistry – Upadhyay and Upadhyay Nath, Himalayan.
2. Introduction to Practical Biochemistry – Shawney, Randhir, Singh, Narasr.

REFERENCES:

1. A Biochemical Guide to Principles and the Techniques of Practical Biochemistry- Keith Wilson and Kenneth Goulding, Cambridge Press.
2. Analytical Biochemistry – R.B. Turner, Elsevier, N.Y.
3. Biomedical Instrumentation – M. Arumugam, Anuradha Agencies, Chennai.
4. Instrumental Methodsof Analysis – Chatwal and Anand,Himalayan Publication.
5. Principles and Techniques of Practical Biochemistry – Bryan L, Williams and Keith Wilson, Cambridge Univ, Press.
6. Practical Biochemistry- Principles and Techniques, Keith Wilson and John Walker, fifth edition, Cambridge Press.
7. Text book of Biochemistry – West and Todd
8. Physical Chemistry – Puri and Sharma

III Semester
CORE PRACTICAL – III
VOLUMETRIC ANALYSIS AND BIOLOGICAL PREPARATION

Paper Code: **3 Hrs/Week**

Credits :4   **Total 15 Practical**

OBJECTIVES:

- ✓ To have knowledge about titrimetric analysis.
- ✓ To know about the isolation of macromolecules from natural source.

VOLUMETRIC ANALYSIS

1. Estimation of iron, oxalate, copper and nitrite.
2. Estimation of chloride by Mohr's method andVolhard's method.
3. Estimation of reducing sugar by iodimetric method.
4. Estimation of calcium by oxalate method.

BIOCHEMICAL PREPARATIONS
1. Preparation of starch from potatoes.
2. Preparation of casein and lactalbumin from milk.
3. Preparation of albumin from egg.
4. Preparation of colloids

PREPARATION OF BUFFERS
Phosphate Buffer, TrisBuffer and Citrate Buffer.

TEXTBOOKS:

1. Text book of Medical Biochemistry – 4thEdition, MN.Chatterjee, Rana Shine, Jaypee Publications.
2. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.

REFERENCES:

1. A Biologist guide to principles and techniques of practical biochemistry.(1975). 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.

SKILLED BASED SUBJECT

FUNDAMENTALS OF COMPUTER

Paper Code: **2   Hrs /Week**

Credits: 3   **Total : 30 Hrs**

OBJECTIVES:
- ✓ To understand the basis of computer & their applications.

UNIT – 1COMPUTER FUNDAMENTALS   **6hrs**

Computer – fundamentals, Classification, digital, analog, hybrid, micro, mini and super computers, personal and advance computers, Generation of computer.operating system, network – LAN, WAN. Difference between computer and human being.

UNIT- 2COMPONENTS OF COMPUTER   **6hrs**

Computer hardware, software, Memory unit, Input unit, Central processing Unit, output unit, UPS and external modem.

UNIT – 3 MS OFFICE   **6hrs**

MS Office - Introduction, Standard menus–file, edit, view, insert, Format menus of MS word, power point, excel.Wordpad, Notepad, Paint.

UNIT – 4COMPUTER MAINTENANCE   **6hrs**

Computer maintenance – causes of failure, components failure, temperature and humidity, dust and other particle, power line problems Computer virus- introduction, types, symptoms, virus avoiding methods, antivirus programs

UNIT – 5 APPLICATIONS   **6hrs**

Computer application in banking, industries, educational institutions, hospitals, Research, ISRO.Electronic mailing, chatting, search engine, web pages.Multimedia and its applications.Downloading software and files, copying CD/DVD.

TEXTBOOKS:

3. Computer fundamental, V.K. Jain.
4. Working in Microsoft office, Ron Mansfield

REFERENCES:

1. Internet & World Wide Web, third edition, Dietel, Dietel, Gold Berg.
2. Multimedia, System design, Prabhat k. Andleigh, KiranThakrar.
3. Programming in C, BalaguruSamy.

NON MAJOR ELECTIVE- I

DIAGNOSTIC BIOCHEMISTRY- I

Paper Code: **2 Hrs /Week**

Credits: 3   **Total : 30 Hrs**

OBJECTIVES: To understand the basis of metabolic disorders, symptoms and their diagnosis.

UNIT- I: SPECIMEN COLLECTION AND ANALYSIS   6 Hrs

Specimen Collection and processing (Blood, urine, faeces), Anti-coagulants and preservatives for blood and urine. Transport of specimens. Osmolarity, physiological saline, iso, hyper and hypotonic solution.

UNIT- II: DISORDERS OF CARBOHYDRATE METABOLISM   6 Hrs

Blood sugar level – factors controlling blood sugar level – hypo, hyperglycemia, Diabetes mellitus – types, GTT.

UNIT- III: DISORDERS OF HEME METABOLISM AND LIVER FUNCTION TESTS   6 Hrs

Metabolism of bilirubin – jaundice – types differential diagnosis and liver function tests.

UNIT- IV: RENAL FUNCTION TESTS   6 Hrs

Renal functional tests – clearance test – Urea, Creatinine, Inulin, PAH test, concentration and dilution test.

UNIT- V: GASTRIC FUNCTION TESTS   6 Hrs

Gastric functional tests – collection of gastric contents, examination of gastric residuum, FTM stimulation test, tubeless gastric analysis.

TEXT BOOKS:

1. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
2. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
3. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
4. Essential of Human physiology by Chembulingam, Saratha publications.

REFERENCES:

1. Clinical chemistry in diagnosis & treatment – P.D. Mayne, ELBS/Arnold, N.Delhi.
2. Text book of Biochemistry with Clinical correlation by T. M. Devlin (1994) John Wiley and Sons.
3. Clinical chemistry in diagnosis and treatment, Joan F.Zilva, PR Pannall, Liyods – Luke (medical books ltd., Lon)
4. Principles of internal medicine (1998) – Harrison, T.R. Fauci, Branuwalad and Isselbaeher, McGraw Hills.
5. Clinical chemistry – W.J. Marshall and S.K.Bangert (1995)
6. Text books of medicine – K.V. Krishnedas (1996), Jaypee Brothers.
7. Biochemistry – U.Sathyanarayana & U.Chakrapani, 3rd Edition, Book and Allied (p) Ltd.

CORE PRACTICAL – IV

COLORIMETRIC AND CYTOLOGICAL TECHNIQUES

Paper Code: **3 Hrs/Week**
Credits :4   **Total 15 Practical**

OBJECTIVES:

   ✓ To understand about the principles, theory and calculation of colorimetric experiment.
   ✓ To have a knowledge of handling microscope and cytological techniques.

COLORIMETRIC ESTIMATION

   1. Estimation of potassium dichromate.
   2. Estimation of inorganic phosphorus by Fiske and Subbarow method.
   3. Estimation of Amino acid by ninhydrin method.
   4. Estimation of Protein by Biuret method.
   5. Estimation of Protein by Bradford method
   6. Estimation of DNA by diphenyl amine method
   7. Estimation of RNA by orcinol method

CYTOLOGICAL TECHNIQUES

   1. Handling of microscopes.
   2. Measurement of cell using micrometer.
   3. Onion root tip smear preparation.
   4. Simple staining.
   5. Differential staining.
   6. Tissue homogenization (demo).

TEXTBOOKS:

   1. Text book of Medical Biochemistry – 4[th]Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
   2. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
   3. Biochemical methods by S. Sadasivam

REFERENCES:

   1. A Biologist guide to principles and techniques of practical biochemistry.(1975). 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.

NON MAJOR ELECTIVE- II
DIAGNOSTIC BIOCHEMISTRY- II

Paper Code: **2 Hrs /Week**
Credits: 3   **Total : 30 Hrs**

OBJECTIVES: To understand the basis of metabolic disorders, symptoms and their diagnosis.

UNIT- I:INBORN ERRORS OF METABOLISM   **6 Hrs**
Inborn errors of metabolism – Alkaptonuria, Phenylketonuria, cystinuria, galactosemia, Fanconi's syndrome and Albinism.

UNIT- II:PLASMA ENZYMES IN DIAGNOSIS   **6 Hrs**
Plasma enzymes in diagnosis – functional and non-functional plasma enzymes, isoenzymes, myocardial infarction, acute pancreatitis, liver diseases and muscle wasting.

UNIT- III: LIPOPROTEINS   **6 Hrs**
Cholesterol – Importance, lipoproteins – factors affecting blood cholesterol, Atherosclerosis, risk factors.

UNIT- IV: ANEMIA   **6 Hrs**
Iron absorption and excretion – Anemia – Classification, Sickle cell anemia and Thalassemia.

UNIT- V:HORMONES   **6 Hrs**
Hormones – Definition and classification – Thyroid hormone – thyroid function test, male and female sex hormones.

TEXT BOOKS:

3. Text book of Medical Biochemistry – 4[th]Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
4. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
5. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd.,Vol.I,II,III.

REFERENCES:
8. Clinical chemistry in diagnosis & treatment – P.D. Mayne, ELBS/Arnold, N.Delhi.
9. Text book of Biochemistry with Clinical correlation by T. M. Devlin (1994) John Wiley and Sons.
10. Clinical chemistry in diagnosis and treatment, Joan F.Zilva, PR Pannall, Liyods – Luke (medical books ltd., Lon)

11. Principles of internal medicine (1998) – Harrison, T.R. Fauci, Branuwalad and Isselbaeher, McGraw Hills.
12. Clinical chemistry – W.J. Marshall and S.K.Bangert (1995)
13. Text books of medicine – K.V. Krishnedas (1996), Jaypee Brothers.
14. Biochemistry – U.Sathyanarayana&U.Chakrapani, 3rd Edition, Book and Allied (P) Ltd.

IV Semester

Paper - IV

BIOPHYSICAL AND BIOCHEMICAL TECHNIQUES – II

Paper Code: **4Hrs/Week**
Credits: 3   **Total : 60 Hrs**

OBJECTIVES:
- ✓ To understand the principles and biological applications of various biochemical techniques.

UNIT- I: CHROMATOGRAPHY – I
       10hrs

General principles of chromatography- partition and adsorption.Principle, operation and applications of paper chromatography and their types. Principle, instrumentation, application of thin layer chromatography,

UNIT- II: CHROMATOGRAPHY – II
       10hrs

Adsorption chromatography, ion exchange chromatography, molecular gel exclusion chromatography and its application in the separation of macromolecules, Affinity Chromatography, Gas Liquid Chromatography.

UNIT- III: CENTRIFUGATION
       15hrs

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.

UNIT- IV: ABSORPTION SPECTRUM
10hrs

Basic properties of electromagnetic radiation, energy, wavelength, wave number, frequency. Absorption and emission spectra.Beer lambert's law.Basic principle, instrumentation and application of colorimetry techniques.Principle, instrumentation, application of UV- visible spectroscopy.

UNIT- V: EMISSION SPECTRUM
15hrs

Spectrofluorimetry techniques- principle, instrumentation andapplications (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).

TEXTBOOKS:

5. Biophysical Chemistry – Upadhyay and UpadhyayNath, Himalayan.
6. Introduction to Practical Biochemistry – Shawney, Randhir, Singh, Narasr.

REFERENCES:

1. A Biochemical Guide to Principles andthe Techniques of Practical Biochemistry- Keith Wilson and Kenneth Goulding, Cambridge Press.
2. Analytical Biochemistry – R.B. Turner, Elsevier, N.Y.
3. Biomedical Instrumentation – M. Arumugam, Anuradha Agencies, Chennai.
4. Instrumental Methoodsof Analysis – Chatwaland Himalayan Publication.
5. Principles and Techniques of Practical Biochemistry – Bryan L, Williams and Keith Wilson, Cambridge Univ, Press.
6. Practical Biochemistry- Principles and Techniques,Keith Wilson and John Walker, fifth edition, Cambridge Press.

Skill Based Paper

BASIC CYTOLOGY ANDCYTOLOGICAL TECHNIQUES

Paper Code: **2 Hrs/Week**
Credits: 3   **Total : 30 Hrs**

OBJECTIVES:

- ✓ To understand the basics of cell structure, function and the techniques involved in their study.

UNIT –I: INTRODUCTION TO CYTOLOGY   **3 Hrs**

History, Father of cytology.Cell theory.Prokaryotic and Eukaryotic cells.Microscopy-history, resolving power, types, anduses.Methods of cell measurement.Microelectrodes,and microthermocouples.Cell fixation, dehydration, embedding, sectioning, and staining for histology.Methods used in molecular biology (cell fractionation, shadow casting).

UNIT – II: MEMBRANE STRUCTURE AND FUNCTION   **7 Hrs**

Cell wall, plasma membranes – Fluid Mosaic Model.Membrane proteins, lipids, carbohydrates and their properties.Diffusion, osmosis, active and passive transport, uniport, symportandantiport.

UNIT – III: INTRACELLULAR ORGANELLS   **9 Hrs**

Endoplasmic reticulum, Mitochondria, Golgi apparatus, Ribosomes and Lysosomes-occurrence, structure, types and functions.Microsomes and microsomal enzymes.

UNIT –IV: CYTOSKELETON   **5 Hrs**

Microtubules-occurrence, structure and functions.Tubulin, actin, myosin.Cilia and flagella- occurrence, structure and functions.Staining for light and electron microscopy.

UNIT –V: NUCLEUS and CELL CYCLE   **6 Hrs**

Nucleus- occurrence, structure (nuclear membrane, nucleolus, nucleoplasm, and chromatin fibre) and functions.Cell cycle, meiotic and mitotic cell divisions.

TEXT BOOK:

1. Cell and Molecular Biology, P.K.Gupta, (2002)
2. Cytology- P.S.Verma, V. K.Agaraval, S. Chand Publications.

REFERENCES:

1. Biochemistry – Garrett Grishmam. 3rdediton. International student's edition.
2. Lehninger Principles of Biochemistry- David L.Nelson, Michael M.Cox, MacmillanWorth Publishers.
3. Molecular Cell Biology- Lodish, Berk, Zipursky, Baltimore, Freeman.
4. Cell biology structure and functions-David and Sadava, Jones Bartlet publishers.
5. Biochemsitry-L.Veerakumari, MJP Publsihers, Chennai-5.
6. Cell Biology- N.Arumugam, Saras Publications.
7. The cell, A Molecular Approach- Geoffrey M.Cooper, 4 editions.
8. Cell and Molecular biology concepts by Gerald Karp (2005).
9. Cell and Molecular Biology- De-Roberties and De-Roberties (2004).
10. Cell and molecular biology: A laboratory manual by K.V. Chaitanya, PHI learning publishers.
11. Cytological techniques by Baker , John Richard's Books publishers

Common to B.Sc., (CS) / B.Sc., (S/W) / B.C.A.
III Semester   OBJECT ORIENTED PROGRAMMING WITH C++
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

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.

UNIT-II :
         12 Hours
Functions in C++ – Classes and Objects – Constructors and Destructors.

UNIT-III :
         12 Hours
Operator Overloading and Type Conversions – Inheritance : Extending Classes – Pointers, Virtual Functions and Polymorphism

UNIT-IV :
         12 Hours
Managing Console I/O Operations – Working with Files

UNIT-V :
         12 Hours
Templates – Exception Handling – Manipulating Strings

         Total : 60 Hours
TEXT BOOK:
Object Oriented Programming with C++, E Balagurusamy , Tata McGraw Hill, 5th Edition, 2012.

REFERENCS:
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. OOPs in C++ ,D.Ravichandran , Tata McGraw Hill, 5th Edition, 1999.

Common to B.Sc.,(CS)/B.Sc (S/W) /B.C.A
III Semester   DATA STRUCTURE AND C++ LAB
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
 To develop programming skills in design and implementation of data structures and their applications.

LIST OF LAB EXERCISES

1. Implementing Stack , Queue operations using pointers
2.   Implementing Infix to postfix conversion using stacks
3. Implementing List operations using pointers
4. Implementing Polynomial addition / Multiplication using pointers.
5. Implementing Recursive tree traversal(in order , pre order, post order)
6. Implementing Quick sort, Merge sort
7.   Operator Overloading (Addition, subtraction, multiplication, inverse of matrices)
8. Function overloading.(Find area/volume of rectangle, circle, sphere, cylinder, cone etc)
9.   Inheritance - Multiple, Multilevel, Hierarchical (College information system)
10. Students Marks details with exception handling (using file I/O classes)

REFERENCE :
Lab Manual

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.
III Semester   FINANCIAL ACCOUNTING – I
ALLIED PAPER – III
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)
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 – Basic Accounting Concepts – Accounting Conventions – Groups Interested in Accounting Information – Types of Accounts – Methods of Accounting – Single Entry System vs. Double Entry System – Golden Rules of Accounting – 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.

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.

UNIT-III:
15 Hours
Trial Balance – Meaning – Objectives – Methods – Total Method – Balance Method – Schedule of Debtors – Schedule of Creditors – Suspense Account – Preparation of Trail Balance.
Errors – Types – Rectification of One-Side Errors – Rectification of Two Side Errors – Rectification through Suspense Account.

UNIT-IV:
15 Hours
Final Accounts – Meaning – Preparation of Final Accounts – Trading Account – Profit & Loss Account – Balance Sheet – Distinction between Trial Balance and Balance Sheet – Adjustment Entries.

UNIT-V:
15 Hours
Partnership: Definition – Partnership Deed – Rules Applicable in the absence of Partnership Deed – Capital Accounts of Partners – Admission of a Partner – Required

Accounting Adjustments – Retirement of an Existing Partner – Required Accounting Adjustments.

Total : 75 Hours

TEXTBOOK:
Financial Accounting, T.S. Reddy & A. Murthy, Margham Publications, 6th Edition, 2012.

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.

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.
III Semester   ACCOUNTANCY LAB – I
ALLIED PRACTICAL – III
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

LIST OF EXCERCISES

1. Creation of New Company, Groups, Ledger.
2. Editing and Deleting Ledgers, Voucher Entries
3. Trading, Profit and Loss A/C.
4. Trial Balance & Balance Sheet.
5. Bank Reconciliation statements
6. Interest Calculation.
7. Consolidation of Accounts
8. Financial Functions I in Excel.
9. Statistical Functions I in Excel.
10. Introduction to Macros I

REFERENCE :
Lab Manual

Subject Code :   Max Marks:100 - 75
(ESE) , 25 (CIA)

Objectives:
To master the design and applications of linear, tree, balanced tree, hashing, set, and graph structures.

UNIT – I :
            9 Hours
Data Design and Implementation : Different Views of Data – Abstraction and Built-in Types.
ADT Sorted List : Abstract Data Type Sorted List., Dynamically Allocated Arrays.
(Chapter 2: Section 2.1,2.2 Chapter 4 : Section 4.1, 4.2)

UNIT – II :
            9 Hours
ADTs Stacks and Queue *(Chapter 5: Section 5.1 to 5.4)*

UNIT – III:
            9 Hours
Circular Linked Lists - Doubly Linked Lists - Programming with Recursion.
Chapter 6 : Section 6.2,6.3 , Chapter 7

UNIT – IV:
            9 Hours
Binary Search Tree – Graphs (*Chapter 8 , Chapter 9 : Section 9.3*)

UNIT – V:
            9 Hours
Sorting : Selection – Insertion – Quick – Merge – Heap Sorts.
Searching : Binary search – Hashing – Collisions – Linear Probing – Clustering – Rehashing – Buckets and Chaining.

            Total : 45 Hours

TEXT BOOK
C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers , 5th Edition, 2011.

REFERENCES:
1. Data Structures and Algorithms, Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Addison Wesley Longman Inc., 2nd Edition, 1999.
2.   Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaz Sahni, Dinesh Mehta, Universities Press, 2nd Edition, 2012(Reprint).

NON MAJOR I - INTRODUCTION TO INFORMATION TECHNOLOGY
(Offered by Computer Science Department to Other Departments)
III Semester

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To introduce the concepts of Information Technology to Non-Computer Science Students.

UNIT I:
        6 Hours
Introduction to Computers –Computer Architecture : CPU, Memory , Communication between various units of a Computer System –

UNIT II:
        6 Hours
Primary Memory – Secondary Storage – Input Devices – Output Devices

UNIT III:
        6 Hours
Computer Languages: Computer Software - Operating System.

UNIT IV:
        6 Hours
Multimedia.

UNIT V:
        6 Hours
Word – Excel – Power Point

        Total : 30 Hours
TEXTBOOK:
1. Introduction to Computer Science, ITL Education Solution Limited, Pearson Education, Fourth Impression, 2009.(For Units I, II ,III and IV Chapters 1, 3(Sections 3.1 to 3.4), 4,5,6,7,9,10,11,15).
2. MS-Office 2007 in a Nutshell , Sanjay Saxena – Vikas Publishing House, 2011. (For Unit V – Chapters 2,3 and 5).

REFERENCES:
1. Information Technology- The Breaking Wave, Dennis P Curtin, Kim Foley, Kunal Sen, Cathleen Morin, McGraw Hill Education India Pvt Ltd., 29th Reprint, 2013.
2. A First Course in Computer, Sanjay Saxsena, Vikas Publishing House.

III-Semester ENTERPRISE RESOURCE PLANNING
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

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

B.C.A.
III-Semester MULTIMEDIA TECHNOLOGIES
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To learn the fundamental concepts and essential skills for career in multimedia. It shows how to use text, images, sound and video to deliver compelling messages and content in meaningful ways.

UNIT – I :
         15 Hours
What is Multimedia : Definitions, Where to use Multimedia, Delivering Multimedia.
TEXT : Using Text in Multimedia – Font Editing and Design Tools – Hypermedia & Hypertext
Chapter 1, Chapter 2: Section 2.3 to 2.6,

UNIT – II :
         15 Hours
IMAGES : Making Still Image – Colours – Image File Formats
SOUND : The Power of Sound – Digital Audio – MIDI Audio - MIDI Versus Digital Audio - Multimedia System Sound – Audio File Formats.
Chapter 3 : Section 3.2 to 3.4 , Chapter 4 : Section 4.1 to 4.6.

UNIT III:
         15 Hours
ANIMATION : The Power of Motion – Principles of Animation – Animation by Computer – Making Animations.
VIDEO : Using Video – How Video Works and is Displayed –Digital Video Containers –Obtaining Video Clips – Shooting and Editing Video. (*Chapter5, Chapter 6)*

UNIT – IV :
         15 Hours
Making Multimedia (*Chapter 7)*

UNIT – V:
         15 Hours
The Internet and Multimedia – Designing for the World Wide Web. (*Chapter 12, Chapter 13)*

                                                                    **Tota
                                                                    l : 75 Hours**

TEXT BOOK :
Multimedia: Making It Work, Tay Vaughan, Tata McGraw Hill, 8th Edition, 2011

REFERENCES:
1. Multimedia Systems Design, Prabhat K. Andleigh, Kiran Thakrar, Prentice Hall India, 2011
2. Multimedia Computing, Communications & Applications, Ralf Steinmetz, Klara Nahrstedt, Pearson Education Inc., 2012.

Common to B.Sc.,(CS)/B.Sc., (S/W) /B.C.A.
IV Semester   **JAVA PROGRAMMING**
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To improve Object Oriented Programming gathered already through an independent platform.

UNIT - I:
        12 Hours
The Primaries – Control Statements – Arrays and Methods.

UNIT - II:
        12 Hours
Classes And Objects – Inheritance and Polymorphism – Interfaces and Packages.

UNIT - III:
        12 Hours
Applets – Abstract Windowing Toolkit-I – Abstract Windowing Toolkit-II.

UNIT - IV:
        12 Hours
Exception Handling.
Multi Threading: Life Cycle, Creating and Running, Methods in Thread Class, Setting Priorty of a Thread, Synchronization, DeadLock, Inner Thread Communication.
I/O Streams: Text and Binary of Data, InputStream and OutputStream Classes, Reader and Writer Classes, DataOutputStream and DataInputStream Classes, StreamTokenizer Class, Random Access File Class.

UNIT -V:
        12 Hours
java.lang Package : Character Class, Object Class, class Class, Math class, String Class, String Buffer Class.
java.util Package: Array List Class, LinkedList Class, Vector, Stack, Date, Gregorian Calendar, String Tokenizer classes.
Java Database Connectivity: Introduction, Establishing Connection, Creation of Data Tables, Entering Data into Table, Table Updating.

Total : 60 Hours

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.
IV Semester   **JAVA PROGRAMMING LAB**
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

LIST OF EXERCISES

Java:

1. Implementing Calendar class / Vector Class and its manipulation.
2. Implementing Control statements.
3. Database creation for storing email address and manipulation
4. Implementing Thread based applications & Exception Handling.
5. Implementing sequential / Random operations

Applets:

6. Working with Frames and various controls.
7. Working with Dialogs and Menus.

AWT:

8. Working with Panel and Layout.
9. Incorporating Graphics.
10. Working with Colors and Font

REFERENCE :
Lab Manual

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.
IV Semester   FINANCIAL ACCOUNTING – II
ALLIED PAPER – IV
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

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.

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.

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).

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.

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.

        Total : 75 Hours

TEXT BOOK:

Financial Accounting, T.S. Reddy & A. Murthy, Margham Publications, 6th Edition, 2012.

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.

Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A.
IV Semester   ACCOUNTANCY LAB – II
ALLIED PRACTICAL – IV
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

LIST OF EXERCISES

1.   Cost Category & Cost centre.
2.   Cost Category & Cost centre using Class
3.   Invoicing.
4.   Inventory & Stock.
5.   Security Control.
6.   Generating Reports.
7.   Creation of Budget.
8.   Financial Functions II in Excel.
9.   Statistical Functions II in Excel
10. Introduction to Macros II

REFERENCE :
Lab Manual

Common to B.Sc., (CS) / B.Sc., (S/W) / B.C.A.
IV Semester   Skill Based II - COMPUTER NETWORKS
(for candidates admitted from 2013-14)

Subject Code: **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To inculcate the concept and mechanism underlying in telecommunications and networking technology.

UNIT – I :
        9 Hours
Data Communication – Networks – Protocols and Standards – Line Configuration – Topology – Transmission mode – Categories of Networks – OSI Model - Functions of the layers – Transmission Media : Guided Media : Coaxial Cable, Twisted Pair Cable, Optical Fibre.
Chapter 1 : Section 1.2 to 1.4 , Chapter 2 : Section 2.1 to 2.4 , Chapter 3 : Section 3.1,3.2
Chapter 7 : Section 7.1.

UNIT – II:
        9 Hours
Types of Errors - Error Detection : LRC , CRC – Checksum - Error Correction : Single bit, Hamming Code, Burst Error – Flow Control – Error Control.
Chapter 9 : Section 9.1,9.2,9.4 to 9.7 , Chapter 10 : Section 10.2,10.3.

UNIT – III:
        9 Hours
Circuit Switching – Packet Switching – Message Switching - UDP - TCP
Chapter 14, Chapter 24 : Section 24.6

UNIT – IV:
        9 Hours
Repeaters – Bridges – Routers – Gateways – Routing Algorithms : Distance Vector Routing - Link State Routing (*Chapter 21*)

UNIT – V :
        9 Hours
Domain Name Space (DNS) – Telnet – FTP - SMTP – HTTP – WWW
Chapter 25 : Section 25.3,25.4,25.5,25.7,25.9,25.10.

        Total : 45 Hours

TEXT BOOK

Data communication and Networking, Behrouz A. Forouzan, Tata McGraw Hill,2nd Edition, 2009,

REFERENCES
1. Data and Computer Communication, William Stallings, Pearson Education, 9th Edition, 2010.
2. Computer Networks ,Larry L.Peterson and Peter S. Davie, Morgan Kaufmann, 5th Edition,2011.
3. Computer Networks ,Andrew S. Tanenbaum, Prentice Hall, 5th Edition, 2011.

B.C.A.
IV Semester   ELECTRONIC COMMERCE
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75 (ESE)**
, 25 (CIA)

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 : Section12.1 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.

B.C.A.
IV Semester OPERATIONS RESEARCH
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75 (ESE)**
, 25 (CIA)

Objectives: To improve the skills of solving very common problems which we come across in various fields like transportation and industries with machines. To develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions.

UNIT – I:
15 Hours
BASICS OF OPERATIONS RESEARCH: Development – Definition – Characteristics – Phases – Models – Advantages and Limitations
LINEAR PROGRAMMING : Formulation – Graphical Method of Solution – General Linear Programming Problem – Canonical and Standard form of LPP   – Simplex method.
Chapter 1: Section 1.1 to 1.3, 1.12, 1.13, 1.16 and 1.17
Chapter 2: Section 2.6, 2.9, 2.11, 2.12 and 2.16

UNIT – II:
15 Hours
TRANSPORTATION MODEL : Definition – Formulation and Solution – Additional Problems
ASSIGNMENT MODEL : Definition – Solution of Assignment Models – Hungarian Method – Additional Problems – Traveling Salesman problem.
Chapter 3: Section 3.3, 3.5 and 3.7
Chapter 4: Section 4.1, 4.4, 4.5, 4.8 and 4.10

UNIT – III : SEQUENCING MODLES
15 Hours
Sequencing Problems – Assumptions – Processing *n* jobs through two machines – Processing *n* jobs through three machines – Processing of two jobs through *m* machines.
Chapter 5 : Section 5.1, 5.2, 5.4, 5.5 and 5.6

UNIT – IV: REPLACEMENT MODELS
15 Hours
Introduction – Replacement of items that deteriorate – Replacement of items whose maintenance and repair cost increase with time – Replacement of items that fail suddenly – group replacement policy.
Chapter 11 : Sections 11.1 to 11.3

UNIT – V: NETWORKING ANALYSIS
15 Hours
Project – Project Planning – Project Scheduling – Project Controlling – Activity on Node diagram – Critical Path Method – Program Evaluation and Review Technique
Chapter 14: Section 14.1 to 14.4, 14.10, 14.12 and 14.13

Total

: 75 Hours

TEXT BOOK
Operations Research, P. K. Gupta and D.S. Hira, , S. Chand & Co, 5th Edition,-2008.

REFERENCES:
1. Operations Research , S.D.Sharma-Kedarnath - Ramnath Delhi 16th Revised Edition, 2010.
2. Introduction to Operations Research, Hiller & Libermann , CBS Publishes, 1st Edition, 1994.

NON MAJOR II – INTERNET AND ITS APPLICATIONS
(Offered by Computer Science Department to Other Departments)
IV Semester

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To introduce the concepts of internet and related terms to Non-Computer Science students.

UNIT - I:
    6 Hours
The Internet and the World Wide Web – Information Technology Today : An Overview(*Chapter 1&2)*

UNIT - II:
    6 Hours
Communications, The Electronic Web. (*Chapter 9)*

UNIT - III:
    6 Hours
Information Technology in Business. (*Chapter 11)*

UNIT - IV:
    6 Hours
Programming and System Development (*Chapter 12)*

UNIT - V:
    6 Hours
Personal, Social and Ethical Issues. (*Chapter 13)*

    Total : 30 Hours

TEXT BOOK
Information Technology- The Breaking Wave, Dennis P Curtin, Kim Foley, Kunal Sen, Cathleen Morin, McGraw Hill Education India Pvt Ltd., 29th Reprint, 2013.

REFERENCES:
1. The Internet Complete Reference, Harley Hahn, TMH, 2nd Edition, 2000.
2. Internet and World Wide Web- How to Program, P.J.Deitel, H.M. Deitel, Prentice Hall, 4th Edition, 2009

COMPLEX ANALYSIS – I

Objectives: To study Cauchy integral formula, local properties of analytic functions, general from of Cauchy's theorem and evaluation of definite integral and harmonic functions.

UNIT–I : CAUCHY'S INTEGRAL FORMULA

The Index of a point with respect to a closed curve – The Integral formula – Higher derivatives.

LOCAL PROPERTIES OF ANALYTIC FUNCTIONS: The Maximum Principle.

Chapter 4 : Section 2: 2.1 to 2.3; Section 3: 3.4

(15 hours)

UNIT–II : THE GENERAL FORM OF CAUCHY'S THEOREM

Chains and Cycles – Simple Connectivity – Homology – The General Statement of Cauchy's Theorem – Proof of Cauchy's Theorem – Locally Exact Differentials – Multiply Connected Regions.

THE CALCULUS OF RESIDUES: Residue Theorem – The Argument Principle.

Chapter 4 : Section 4: 4.1 to 4.7; Section 5 : 5.1 to 5.2

(15 hours)

UNIT–III : THE CALCULUS OF RESIDUES

Evaluation of Definite Integrals. HARMONIC FUNCTIONS: Definition of Harmonic Function and Basic Properties – Mean Value Property – Poisson Formula.

Chapter 4 : Section 5 : 5.3 ; Chapter 4 : Section 6 : 6.1 to 6.3

(15 hours)

UNIT–IV : HARMONIC FUNCTIONS AND POWER SERIES EXPANSIONS

Schwarz's Theorem – The Reflection Principle – Weierstrass's Theorem – Taylor's Series –Laurent's Series.

Chapter 4 : Sections 6: 6.4 and 6.5; Chapter 5 : Sections 1: 1.1 to 1.3

(15 hours)

UNIT–V : PARTIAL FRACTIONS AND ENTIRE FUNCTIONS

Partial fractions – Infinite products – Canonical products – Gamma function.

ENTIRE FUNCTIONS: Jensen's formula – Hadamard's theorem.

Chapter 5 : Sections 2: 2.1 to 2.4; Chapter 5 : Sections 3: 3.1 and 3.2

(15 hours)

CONTENT AND TREATMENT AS IN:

COMPLEX ANALYSIS, (Third Edition), *Lars V. Ahlfors,* (1979), McGraw Hill Co, New York.

REFERENCES:

1. INTRODUCTION TO COMPLEX ANALYSIS, *H. A. Presfly,* (1990), Clarendon Press, Oxford.
2. FUNCTIONS OF ONE COMPLEX VARIABLES, *J. B. Conway,* (1978), Springer –Verlag, International Student Edition, Narosa Publishing Co.
3. ANALYTIC FUNCTION THEORY, *E. Hille,* (1959), (vol II), Gonm & Co.

SEMESTER III

PAPER X   **TOPOLOGY**

Objectives: To study topological spaces, continuous functions, connectedness, compactness, countability and separation axioms.

UNIT–I : TOPOLOGICAL SPACES
Topological spaces – Basis of a topology – The order topology – The product topology on X Y – The Subspace topology – Closed sets and limit points.
Chapter 2: section 12 to 17.
(18 hours)

UNIT–II : CONTINUOUS FUNCTIONS
Continuous functions – The product topology – The metric topology.
Chapter 2: sections 18 to 21 [omit section 22]
(18 hours)

UNIT–III : CONNECTEDNESS
Connected spaces – Connected subspaces of the real line – Components and local connectedness.
Chapter 3: section 23 to 25.
(18 hours)

UNIT–IV : COMPACTNESS
Compact spaces – Compact subspaces of the real line – Limit point compactness – Local compactness.
Chapter 3: sections 26 to 29
(18 hours)

UNIT–V : COUNTABILITY AND SEPARATION AXIOMS
The countability Axioms – The separation axioms – Normal spaces – The Urysohn lemma – The Urysohn metrization theorem – The Tietz extension theorem.
Chapter 4: sections 30 to 35.
(18 hours)

CONTENT AND TREATMENT AS IN:

TOPOLOGY, *James R. Munkres,* (2002), (Second Edition), Pearson Education, New Delhi. [Third Indian Reprint].

REFERENCES:

1. TOPOLOGY, *J. Dugundji*, (1975), Prentice Hall of India , New Delhi.
2. INTRODUCTIONS TO TOPOLOGY AND MODERN ANALYSIS, *George F.Sinmons,* (1963), McGraw Hill.
3. GENERAL TOPOLOGY, *J. L. Kelly,* Van Nostrand, Reinhold Co, New York.
4. COUNTER EXAMPLES IN TOPOLOGY, *L. Sten and J. Subash,* Holt, Rinehart and Winston.
5. GENERAL TOPOLOGY, *S. Willard,* (1970), Addison Wesley Mass.

SEMESTER III

PAPER XI   **PROBABILITY THEORY**

Objectives: To introduce axiomatic approach to probability theory, to study some statistical characteristics, discrete and continuous distribution functions and their properties, characteristic function and basic limit theorems of probability.

UNIT–I : RANDOM EVENTS AND RANDOM VARIABLES
Random events – Probability axioms – Combinatorial formulae – Conditional probability – Bayes Theorem – Independent events – Random Variables – Distribution Function – Joint Distribution – Marginal Distribution – Conditional Distribution – Independent random variables – Functions of random variables.
Chapter 1: Sections 1.1 to 1.7 ; Chapter 2: Sections 2.1 to 2.9
(15 hours)

UNIT–II : PARAMETERS OF THE DISTRIBUTION
Expectation – Moments – The Chebyshev's Inequality – Absolute moments – Order parameters – Moments of random vectors – Regression of the first and second types.
Chapter 3: Sections 3.1 to 3.8
(15 hours)

UNIT–III : CHARACTERISTIC FUNCTIONS
Properties of characteristic functions – Characteristic functions and moments – Semi invariants –Characteristic function of the sum of the independent random variables – Determination of distribution function by the Characteristic function – Characteristic function of multidimensional random vectors – Probability generating functions.
Chapter 4: Sections 4.1 to 4.7
(15 hours)

UNIT–IV : SOME PROBABILITY DISTRIBUTIONS
One point, two point, Binomial – Polya – Hypergeometric – Poisson (discrete) distributions – Uniform – Normal - Gamma – Beta – Cauchy and Laplace (continuous) distributions.
Chapter 5 : Section 5.1 to 5.10 [omit Section 5.11]
(15 hours)

UNIT–V : LIMIT THEOREMS
Stochastic convergence – Bernoulli law of large numbers – Convergence of sequence of distribution functions – Levy–Cramer Theorems – de Moivre Laplace theorem – Poisson, Chebyshev, Khintchine Weak law of large numbers – Lindberg Theorem – Lyapunov theorem.
Chapter 6 : Sections 6.1 to 6.4,6.6 to 6.8 [omit sections 6.5, 6.9 to 6.15]
(15 hours)

CONTENT AND TREATMENT AS IN:

PROBABILITY THEORY AND MATHEMATICAL STATISTICS, *M. Fisz,* (1963), John Wiley and sons, New York.

REFERENCES:

1. REAL ANALYSIS AND PROBABILITY, *R. B. Ash,* (1972), Academic Press, New York.
2. A COURSE IN PROBABILITY, *K. L. Chung,* (1974), Academic press NewYork.
3. PROBABILITY THEORY AND EXAMPLES, (Second edition), *R. Durrett,* (1996), Duxbury press, New York.
4. AN INTRODUCTION TO PROBABILITY THEORY ANDMATHEMATICAL STATISTICS, *V. K. Rohatgi,* (1988), Wiley Eastern, New Delhi.
5. A PROBABILITY PATH, *S. I. Resnick,* (1999), Birhauser, Berlin.
6. MODERN PROBABILITY THEORY, (Third edition), *B. R. Bhat,* (1999), New Age International, New Delhi.

SEMESTER III

PAPER XII **FLUID DYNAMICS**

Objectives: This course aims to discuss kinematics of fluids in motion, equation of motion of a
fluid, three dimensional flows and viscous flows.

UNIT–I : KINEMATICS OF FLUIDS IN MOTION
Real fluids and ideal fluids – Velocity of a fluid at a point, Stream lines, path lines, steady and unsteady flows – Velocity potential – The vorticity vector – Local and particle rates of changes – Equations of continuity – Worked examples – Acceleration of a fluid – Conditions at a rigid boundary.
Chapter 2 : Sections 2.1 to 2.10
(15 hours)

UNIT–II : EQUATIONS OF MOTION OF FLUID
Pressure at a point in a fluid at rest – Pressure at a point in a moving fluid – Conditions at a boundary of two inviscid immiscible fluids – Euler's equation of motion – Discussion of the case of steady motion under conservative body forces.
Chapter 3 : Sections 3.1 to 3.7.
(15 hours)

UNIT–III : SOME THREE DIMENSIONAL FLOWS
Introduction – Sources sinks and doublets – Images in a rigid infinite plane – Axis symmetric flows – Stokes stream function.
Chapter 4 : Sections 4.1, 4.2, 4.3, 4.5.
(15 hours)

UNIT–IV : SOME TWO DIMENSIONAL FLOWS
Meaning of two dimensional flow – Use of Cylindrical polar coordinate – The stream function – The complex potential for two dimensional, irrational imcompressible flow – Complex velocity potentials for standard two dimensional flows – Some worked examples – Two dimensional image systems – The Milne Thompson circle Theorem.
Chapter 5 : Sections 5.1 to 5.8
(15 hours)

UNIT–V : VISCOUS FLOWS
Stress components in a real fluid – Relations between Cartesian components of stress Translational motion of fluid elements – The rate of strain quadric and principal stresses – Some further properties of the rate of strain quadric – Stress analysis in fluid motion – Relation between stress and rate of strain – The coeffcient of viscosity and Laminar flow – The Navier – Stokes equations of motion of a Viscous fluid.
Chapter 8 : Sections 8.1 to 8.9.
(15 hours)
CONTENT AND TREATMENT AS IN:
TEXT BOOK OF FLUID DYNAMICS, *F. Chorlton,* (1985), CBS Publications, NewDelhi.

REFERENCES:
1. INTRODUCTION TO FLUID MECHANICS, *R. W. Fox and A. T. McDonald,* (1985), Wiley.
2. FLUID MECHANICS WITH PROBLEMS AND SOLUTIONS, *E. Krause,* (2005), Springer.

SEMESTER III   **ELECTIVE III**

PAPER III A   **TENSOR ANALYSIS AND RELATIVITY**

Objectives: The course aims to introduce vector algebra and vector calculus and special relativity and relativistic kinematics, dynamics and accelerated systems.

UNIT–I : TENSOR ALGEBRA
Systems of Different orders – Summation Convention –Konecker Symbols – Transformation of Coordinates in S_n – Invariants – Covariant and Contra variant vectors – Tensors of second order – Mixed Tensors – Zero Tensor – Tensor Field – Algebra of tensors – Equality of tensors – Symmetric and Skew– symmetric tensors – Outer multiplication, contraction and Inner multiplication – Quotient law of tensors – Reciprocal tensors of tensors – Relative tensor – Crossproduct of vectors.
Chapter I: I.1 – I.3, I .7 and I.8, Chapter II: II.1 – II.19
(15 hours)

UNIT–II : TENSOR CALCULUS
Riemannian space – Christoffel symbols and their properties.
Chapter III: III.1 and III.2
(15 hours)

UNIT–III : TENSOR CALCULUS (Cont . . .)
Covariant Differentiation of Tensors – Riemann–Christoffel Curvature Tensor – Intrinsic Differentiation.
Chapter III: III.3 – III.5
(15 hours)

UNIT–IV : SPECIAL THEORY OF RELATIVITY
Galilean transformation – Maxwell'sequation – The ether theory – The principle of Relativity.
RELATIVISTIC KINEMATICS: Lorentz transformation equations – Events and Simultaneity – Example – Einstein train – Time Dilation – Longitudinal Contraction – Invariant Interval – proper time and proper distance – World line – Example – Twin Paradox – Addition of Velocities – Relativistic Doppler Effect.
Chapter 7 :sections 7 .1 and 7.2
(15 hours)

UNIT–V : RELATIVISTIC DYNAMICS
Momentum – Energy – Momentum energy fourvector – Force – Conservation of energy – Mass and energy – Example – Inelastic collision – Principle of Equivalence – Lagrangian and Hamiltonian Formulations.

ACCELERATED SYSTEMS: Rocket with constant acceleration – Example – Rocket with constant thrust.
Chapter 7 : sections 7.3 and 7.4
(15 hours)

CONTENT AND TREATMENT AS IN:
1. TENSOR CALCULUS, Units I, II and III *U.C. De Absos Ali Shaikh and Joydeep Sengupta,* (2004), Narosa Publishing House, New Delhi.
2. CLASSICAL DYNAMICS Units IV and V (1985), *D. Greenwood,* Prentice Hall of India, New Delhi.

REFERENCES:

1. TENSOR CALCULUS, *J. L. Synge and A. Schild,* (1949), Toronto.
2. THE MATHEMATICAL THEORY OF RELATIVITY, *A. S. Eddington,* (1930), Cambridge University Press.
3. AN INTRODUCTION TO THEORY OF RELATIVITY, *P. G. Bergman,* (1942),   New York.
4. RIEMANNIANGEOMETRY AND THE TENSOR CALCULUS, *C. E. Weatherburn,* (1988), Cambridge.

SEMESTER III   **ELECTIVE III**

PAPER III B   **FUZZY SETS AND THEIR APPLICATIONS**

UNIT - I : FUZZY SETS

Fuzzy sets – Basic types – Basic concepts – Characteristics – Significance of the paradigm shift – Additional properties of α - Cuts
Chapter 1 : Sections 1.3 to 1.5
Chapter 2 : Section 2.1
(15 hours)

UNIT - II : FUZZY SETS VERSUS CRISP SETS

Representation of Fuzzy sets – Extension principle of Fuzzy sets – Operation on Fuzzy Sets – Types of Operation – Fuzzy complements.
Chapter 2 : Sections 2.2 to 2.3
Chapter3: Sections 3.1 to 3.2
(15 hours)

UNIT - III : OPERATIONS ON FUZZY SETS

Fuzzy intersection – t-norms, Fuzzy unions – t conforms – Combinations of operations – Aggregation operations.
Chapter 3 : Sections 3.3 to 3.6
(15 hours)

UNIT - IV : FUZZY ARITHMETIC

Fuzzy numbers – Linguistic Variables – Arithmetic operation on intervals – Lattice of Fuzzy numbers
Chapter 4 : Sections 4.1 to 4.4
(15 hours)

UNIT - V : CONSTRUCTION FUZZY SETS

Methods of construction : An overview – Direct methods with one expert – Direct method with multiple experts – Indirect method with multiple experts and one expert – Construction from sample data.
Chapter 10 : Sections 10.1 to 10.7
(15 hours)

CONTENT AND TREATMENT AS IN:

FUZZY SETS AND FUZZY LOGIC : THEORY AND APPLICATIONS, *G. J. Klir and   Bo Yuan,* (2005), Prentice Hall of India Ltd, New Delhi.

REFERENCES:

1. FUZZY SET THEORY AND ITS APPLICATIONS, *H. J. Zimmermann,* (1996), Allied Publishers, Chennai.
2. INTRODUCTION TO THE THEORY OF FUZZY SUBSETS, *A. Kaufman,* (1975), Academic Press, New York.

3. FUZZY SETS AND THEIR APPLICATIONS, *V. Novak,* (1969), Adam Hilger, Bristol.

SEMESTER III   **ELECTIVE IV: NONMAJOR**

PAPER IV   **MATHEMATICAL SOFTWARE**

Objectives: This course aims to practice the students in Mathematics document preparation and utilizing the software facility available for tedious computations.

CREATING A DOCUMENT USING LATEX

- Title creation
- Page Layout
- Formatting
- Fonts
- List Structures
- Tables
- Bibliography Management.

MATLAB BASICS

- Algebra and Arithmetic
- Calculus, Graphics and Linear Algebra
- MATLAB Programming

REFERENCES:

1. LATEX MANUAL.
2. A GUIDE TO MATLAB FOR BEGINNERS AND EXPERIENCED USERS, *Brain R. Hunt, Ronald R. Lipsman and Jonathan M. Rosenberg,* (2003), Cambridge University Press.
3. INTRODUCTION TO MATLAB, *Rose L. Spencer.*

SEMESTER IV

PAPER XIII **COMPLEX ANALYSIS II**

Objectives: To study Riemann Zeta function and normal families .Riemann mappingtheorem, Conformal mapping of polygons, Harmonic functions, Elliptic functionsand Weistrass theory of analytic continuation.

UNIT–I : RIEMANN ZETA FUNCTION AND NORMAL FAMILIES
The Productdevelopment – Extension of $\zeta(s)$ to the whole plane – The functional equation – The zeros of zeta function – Equicontinuity – Normality and compactness – Arzela 'stheorem – Families of analytic functions.
Chapter 5 : Section 4: 4.1 to 4.4 Chapter 5 : Section 5: 5.1 to 5.4.
(18 hours)

UNIT–II : RIEMANN MAPPING THEOREM
Statement and proof – Boundary Behaviour – Use of the Reflection Principle.
CONFORMAL MAPPING OF POLYGONS: The Behaviour at an angle – SchwartzChristo
el formula – Mapping on a rectangle.
HARMONIC FUNCTIONS: Functions with mean value property – Harnark'sprinciple.
Chapter 6 : Section 1: 1.1 to 1.3 ; Chapter 6 : Section 2: 2.1 to 2.3;
Chapter 6 :Section 3: 3.1 and 3.2.
(18 hours)

UNIT–III : ELLIPTIC FUNCTIONS
Simply periodic functions – Doubly periodic functions.
Chapter 7 : Section 1: 1.1 to 1.3; Chapter 7 : Section 2: 2.1 to 2.4
(18 hours)

UNIT–IV : WEIRSTRASS THEORY
The Weirstrass $\wp$-function – The functions $\zeta(z)$ and $\sigma(z)$ – The differential equation – The Modular function $\lambda(\tau)$ – The conformal mapping by $\lambda(\tau)$.
Chapter 7 : Section 3: 3.1 to 3.5
(18 hours)

UNIT–V : ANALYTIC CONTINUATIONS
The Weirstrass theory – Germs and sheaves sections and Riemann surfaces – Analytic continuation along Arcs – Harmonic curves – The Monodromy theorem – Branch points.
Chapter 8 : Section 1: 1.1 to 1.7.
(18 hours)

CONTENT AND TREATMENT AS IN:

COMPLEX ANALYSIS, (Third Edition), *Lars V.Ahlfors,* (1979), McGraw Hill Book Company.

REFERENCES:

1. INTRODUCTION TO COMPLEX ANALYSIS, *H. A. Prestly,* (1990), Clarendon Press, Oxford.
2. FUNCTION OF ONE COMPLEX VARIABLE, *J. B. Corway,* Springer – Verlag, Narosa publishing co.

SEMESTER IV

PAPER XIV   **FUNCTIONAL ANALYSIS**

Objectives: To study the details of Banach and Hilbert spaces and to introduce Banach algebras.

UNIT–I : BANACH SPACES
Definition and Some examples – Continuous Linear Transformations – The Hahn Banach Theorem – The Natural embedding of N in N^{**}.
Chapter 9: sections 46 to 49.
(18 hours)

UNIT–II : BANACH SPACES AND HILBERT SPACES
Open Mapping Theorem – Conjugate of an operator – Definition and some simple properties of Hilbert spaces – Orthogonal complements – Orthonormal sets.
Chapter 9 : Sections 50 and 51. Chapter 10 : Sections 52, 53 and 54.
(18 hours)

UNIT–III : HILBERT SPACES
Conjugate space H^*– Adjoint of an operator – Self-adjoint operator – Normal and Unitary operators – Projections.
Chapter 10 : Sections 55, 56, 57, 58 and 59.
(18 hours)

UNIT–IV : GENERAL PRELIMINARIES ON BANACH ALGEBRAS
Definition and some examples – Regular and singular elements – Topological divisors of zeros – The formula for the spectral radius.
Chapter 12 : Sections 64 to 66 and 68.
(18 hours)

UNIT–V : THE STRUCTURE OF COMMUTATIVE BANACH ALGEBRAS
Gelfand Mapping – Applications of the formula $r(x) = \|x^n\|^{1/n}$ – Involutions in Banach Algebras – Gelfand – Neumark Theorem.
Chapter 13 : Section 70 to 73.
(18 hours)

CONTENT AND TREATMENT AS IN:

INTRODUCTION TO TOPOLOGY AND MODERN ANALYSIS, *G. F. Simmons,* (1963), McGraw Hill, New York.

REFERENCES:

1. FUNCTIONAL ANALYSIS, *W. Rudin,* (1973), Tata McGraw Hill, New Delhi.
2. FUNCTIONAL ANALYSIS, *G. Bauhman and L. Narici,* (1966), Academic Press,   New York.
3. FIRST COURSE IN FUNCTIONAL ANALYSIS, *H. C. Goffman and G. Fedrick,* (1987), Prentice Hall of India, New Delhi.
4. INTRODUCTORY FUNCTIONAL ANALYSIS WITH APPLICATIONS, *E. Kreyszig,* (1978), John Wiley & sons, New York.

SEMESTER IV

PAPER – XV   **MATHEMATICAL STATISTICS**

Objectives: This course introduces sampling theory, significance tests, estimation, testing of hypothesis, ANOVA and sequential analysis with rigorous mathematical treatment.

UNIT–I : SAMPLE MOMENTS AND THEIR FUNCTIONS
Notion of a sample and astatistic – Distribution of the arithmetic mean of independent normally distributed random variables – the χ^2 distribution – the distribution of the statistic (X; S) –student t – distribution – Fisher's Z – distribution –Snedecor's F – distribution –Distribution of X from non–normal populations.
Chapter 9 : Section 9.1 to 9. 8.
(18 hours)

UNIT–II
The theorems of Kolmogorov and Smirnov.
SIGNIFICANCE TEST: Concept of a statistical test –Parameteric tests for smallsamples and large samples χ^2 test – The test of Kolmogorov and smirnov type– the Wald Wolfovitz and Wilcoxon–Mann– Whitney tests – Independence tests by contingency tables.
Chapter 10: Section 10.11 ; Chapter 12: Section 12.1 to 12 .7
(18 hours)

UNIT–III : ESTIMATION
Preliminary notion – Consistent estimates – Unbiased estimates – Suffiency–Effciency–Asymptotically most efficient estimates – Methods of finding estimates – Confidence interval
Chapter 13: Sections 13.1 to 13.8
(18 hours)

UNIT–IV : ANALYSIS OF VARIANCE
One way classification and two way classification
HYPOTHESIS TESTING: Power functions and the OC function – Most powerful test – Uniformly most powerful test – unbiased test .
Chapter 15: Sections 15.1 and 15.2; Chapter 16: Sections 16.1 to 16 .5.
(18 hours)

UNIT–V : SEQUENTIAL ANALYSIS
SPRT – Auxiliary theorem – Wald's fundamental identity – OC function and SPRT –
E(n) and determination of A and B – Testing a hypothesis concerning p on $0 - 1$
distribution and m in Normal distribution.
Chapter 17: Sections 17.1 to 17.9
(18 hours)

CONTENT AND TREATMENT AS IN:
PROBABILITY THEOREM AND MATHEMATICAL STATISTICS, *M. Fisz,* (1963),
John Wiley and sons , New York.

REFERENCES:
1. MODERN MATHEMATICAL STATISTICS, *E. J. Dudewicz and S. N. Mishra,* (1963), John Wiley, New York.
2. AN INTRODUCTION TO PROBABILITY THEORY ANDMATHEMATICAL STATISTICS, *V. K. Rohatgi,* (1988), Wiley Eastern.

SEMESTER IV

PAPER – XVI   DIFFERENTIAL GEOMETRY

Objectives: This course introduces space curves and their intrinsic properties of a
surface and geodesics. The non–intrinsic properties of a surface and the differential
geometry of surfaces are explored.

UNIT – I : SPACE CURVES
Definition of a space curve – Arc length – Tangent – Normal and binormal – Curvature
and torsion – Contact between curves and surfaces – Tangent surface – Involutes and
evolutes – intrinsic equations – Fundamental existence theorem for space curve –
Helices.
Chapter 1 : Sections 1 to 9
(18 hours)

UNIT – II : INTRINSIC PROPERTIES OF A SURFACE
Definition of a surface – Curves on a surface – Surface of revolution – Helicoids –
Metric – Direction coefficients – Families of curves – Isometric correspondence –
Intrinsic properties.
Chapter 2 : Sections 1 to 9
(18 hours)

UNIT – III : GEODESICS
Geodesics – Canonical geodesic equations – Normal properties of geodesics –
Existence theorem – Geodesic parallels – Geodesic curvatures – Gauss Bonnet theorem
– Gaussian curvature – Surface of constant curvature.
Chapter 2 : Sections 10 to 18
(18 hours)

UNIT – IV : NON–INTRINSIC PROPERTIES OF A SURFACE
The second fundamental form – Principal curvature – Lines of curvature – Developable – Developable associated with space curves and with curves on surface – Minimal surfaces – Ruled surfaces.
Chapter 1 : Sections 1 to 8
(18 hours)

UNIT – V : DIFFERENTIAL GEOMETRY OF SURFACES
Fundamental equations of surface theory – Fundamental existence theorem for surfaces – Compact surfaces whose points are umbilics – Hilbert's lemma – Compact surfaces of constant curvature – Complete surfaces.
Chapter 3 : Sections 9 to 10
Chapter 4 : Sections 1 to 5
(18 hours)

CONTENT AND TREATMENT AS IN:
An INTRODUCTION TO DIFFERENTIAL GEOMETRY, *T. J. Willmore,* (2002), Oxford University Press, New Delhi.

REFERENCES:
1. LECTURES ON CLASSICAL DIFFERENTIAL GEOMETRY, *D. T. Struik,* (1950), Addison Wesley, Mass.
2. FOUNDATIONS OF DIFFERENTIAL GEOMETRY, *Kobayashi and K. Nomizu,* (1963), Interscience.

SEMESTER IV   **ELECTIVE V**

PAPER V A   **ACTUARIAL MATHEMATICS**

Objectives: To develop working knowledge of real world problems like investments, premium calculation in insurance, profit testing unit-linked polices, pension plan and future projections.

UNIT -I : BASIC FINANCIAL MATHEMATICS
Simple and compound interest – Actuarial notion for financial mathematics.   (18 hours)

UNIT- II : INTRODUCTION TO LIFE CONTINGENCIES
Survival probability – Death probabilities – deterministic modeling.   (18 hours)

UNIT–III : INTRODUCTION TO ACTUARIAL MATHEMATICS
Life-contingent annuity factors – Premium payable for an annuity – Assurance factors – Guaranteed endowments – Premium calculations for assurance benefits.   (18 hours)

UNIT- IV : UNIT LIKED PRODUCTS
Charging structure – Benefit flexibility – Investment flexibility – Unit price – Market practice.   (18 hours)

UNIT–V : BASIC PENSION MATHEMATICS
Theory and practice of pension plan funding – Concepts of normal cost – Supplemental liability – Unfunded liability – Projected benefit cost methods.   (18 hours)

CONTENT AND TREATMENT AS IN:

ACTUARIAL MATHEMATICS FOR LIFE CONTINGENT RISKS, *David C. M. Dickson, Mary R. Hardy and Howard R. Waters,* (2013), International Series on Actuarial Science, Camb

SEMESTER IV   **ELECTIVE V**

Paper V B   **NUMBER THEORY AND CRYPTOGRAPHY**

Objectives: This course aims to give elementary ideas from number theory which will have applications in cryptography.

UNIT – I : SOME TOPICS IN ELEMENTARY NUMBER THEORY
Time Estimates for doing arithmetic – Divisibility and Euclidean Algorithm – Congruence's – Some applications to Factoring.
Chapter I
(18 hours)

UNIT – II : CRYPTOGRAPHY
Some simple cryptosystems – Enciphering matrices.
CHAPTER III   (18 hours)

UNIT – III : FINITE FIELDS AND QUADRATIC RESIDUES
Finite fields – Quadratics – Residues and reciprocity.
CHAPTER II
(18 hours)

UNIT – IV : PUBLIC KEY
The idea of Public key Cryptography – RSA – Discrete Law – Knapsack – Zero – Knowledge.
CHAPTER IV : Sections 1 to 4; (Omit Section 5)
(18 hours)

UNIT – V : PRIMALITY AND FACTORING
Pseudo–primes – The rho method – Fermat factorization and factor bases – The continued fraction method – The quadratic sieve method.
CHAPTER V
(18 hours)

CONTENT AND TREATMENT AS IN:

A COURSE IN NUMBER THEORY AND CRYPTOGRAPHY, *Neal Koblitz,* (1987), Springer –Verlag, New york.

REFERENCES:

1. AN INTRODUCTION TO THEORY OF NUMBERS, *Niven and Zuckerman,* (1976), [Third Edition], Wiley Eastern Ltd, New Delhi.
2. ELEMENTARY NUMBER THEORY, *David M. Burton,* (1989), Wm. C. Brown Publishers, Dubuque, Iowa.
3. A CLASSICAL INTRODUCTION TO MODERN NUMBER THEORY, *K. Ireland and M. Rosen,* (1972), Springer–Verlag.

ORGANIC SPECTROSCOPY AND CHEMISTRY OF NATURAL PRODUCTS
(90 HOURS)

PAPER CODE: P3CH3001

OBJECTIVE:
To understand the concepts of spectral techniques and to apply these techniques for the quantitative and structural analysis of organic compounds. To learn Alkaloids, Steroids, Hetrocyclic compounds, Aromoticity photochemical reactions and their importance.

UNIT I – UV, IR AND NMR SPECTROSCOPY

Ultraviolet – Visible spectroscopy – types of electronic transitions – chromophores and auxochromes – factors influencing positions and intensity of absorption bands – absorption spectra of dienes, polyenes and α, β - unsaturated carbonyl compounds – Woodward – Fiser rules.

IR Spectroscopy – vibrational frequencies and factors affecting them – identification of functional groups – intra and inter molecular hydrogen bonding – finger print region.

Nuclear spin- magnetic movement of a nucleus – nuclear energy levels in the presence of magnetic field– basic principles of NMR experiments – CW and FT NMR – ^{1}H NMR – chemical shift and coupling constant – factors influencing proton chemical shift and vicinal proton – proton coupling constant – ^{1}H NMR spectra of simple organic molecules AX and AMX spin system – spin decoupling – nuclear over Hauser effect-chemical exchange.
^{13}C NMR – proton decoupled and off – resonance ^{13}C NMR spectra – factors affecting ^{13}C chemical shift – ^{13}C NMR spectra of simple organic molecules.

UNIT II - PHYSICAL METHODS OF STRUCTURAL DETERMINATION

Mass Spectrometry – Principles – measurement techniques – (EI, CI) – presentation of spectral data – molecular ions – isotope ions – fragment ions of odd and even electron types – rearrangement ions – factors affecting cleavage pattern – simple and multicenter fragmentation – McLafferty rearrangement. Mass spectra of hydrocarbons, alcohols, phenols, aldehydes and ketones.CD and ORD Octant rule, cotton effect, axial halo ketone rule, and its applications.
Problems solving using all spectral data (limited to 10 carbon atoms).

UNIT III – ALKALOIDS AND STEROIDS

Total synthesis of quinine, morphine, reserpine and cocaine.

Synthesis of cholesterol, oestrone, carotenes, conversion of cholesterol to progesterone Oestrone and testosterone.Structural Elucidation of cholesterol.

UNIT IV – HETERO CYCLIC COMPOUNDS

Synthesis and reactionsof Imidazoleoxazole, thiazole, flavones, isoflavones, anthocyanins, pyrimidines (cytocinethymine and uracil only) and purines (adenine, guanine only).

UNIT V –ORGANIC PHOTOCHEMISTRY AND AROMATICITY

Photochemical excitation – fate of the excited molecules – Joblonski diagram – study of photochemical reactions of ketone – Photoreduction – photocyclo addition – Paterno – Buchi reaction – di pi-methane rearrangement – Pericyclic reactions – classification – orbital symmetry – Woodward Hoffman rules – Analysis of electrocyclic, cyclo addition and sigmatropic reactions – correlation diagrams for butadiene – cyclobutene system. Inter conversion of hexatrienes to cyclohexadienes,Structure of bulvalene, a fluxional molecule – Cope and Claisen rearrangement.
Aromaticity of benzenoid, heterocyclic, and non-benzenoid compounds, Huckel's rule – Aromatic systems with pi electron numbers other than six – non-aromatic (cyclooctatetraene etc.,) and anti-aromatic system (cyclobutadiene etc.) – system with more than 10pi electrons – Annulenes up to C_{18} (synthesis of all these compounds is not expected).

RECOMMENDED BOOKS

1. Application of absorption spectroscopy of organic compounds by J. Dyer, Prentice – Hall of India, Pvt.,New Delhi.,
2. Spectrometric identification of organic compounds by R.M. Silverstein, G.d. Bassler and Monsu. John Wiley and Sons, New York.
3. Introduction to the spectroscopic methods for the identification organic compounds – 2 volumes, SchiemannPergamman Press.
4. Organic Chemistry, Vol. II, I.L. Finar, 5th edition ELBS publication.
5. Spectroscopy of Organic compounds by P.S. Kalsi, Wiley Eastern Ltd., Chennai.
6. Molecular reaction and photochemistry by Charles H.Depuy and Orville, L. Chapmann, Prentice Hall of India Pvt., Ltd., New Delhi.
7. Introduction to Chemistry of heterocyclic compounds by R.M. Acheson, Interscience Publishers.
8. Principles of Modern heterocyclic chemistry by L.A. Pacquette, Benjamin Cummings Publishing Co., London 1978.
9. Advanced organic chemistry III Edition by J. March.
10. Advanced organic Chemistry by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990).
11. Physical organic chemistry by Neil S. Issac, ELBS publication 1987.
12. Organic reaction mechanism, Macmillan India, 1999.
13. Spectroscopy W. Kemp, Macmillan Ltd.,
14. Structural identification of organic compounds Y.R. Sharma, S. Chand & Co.
15. Chemistry of Organic Natural products Vol. 1 & 2 by OP Agarwal.
16. Organic Reaction & Mechanism by OP Agarwal.

MODERN PHYSICAL CHEMISTRY (90 HOURS)

PAPER CODE: P3CH3002

OBJECTIVE:

To study the application of Quantum Chemistry to chemical bonding. To study the ionic conductance, Electrode – Electrolytic interface. To study the kinetics of polymerization and to study NMR spectroscopyand itsapplications.

UNIT I – QUANTUM CHEMISTRY

Approximation methods – perturbation and variation methods – application to hydrogen and helium atoms – R.S. Coupling and term symbols for atoms in the ground state.

Born – Oppenheimer approximation – Valence bond theory for hydrogen molecule – LCAO – MO theory for di- and polyatomic molecules.Concept of hybridization – Huckel theory for conjugated molecules (Ethylene, butadiene and benzene) – semi – empirical methods – Slater orbital and HF – SCF methods.

UNIT II – ELECTROCHEMISTRY - I

Mean ionic activity and mean ionic activity coefficient – concept of ionic strength, Debye – Huckel theory of strong electrolytes – activity coefficient of strong electrolytes – determination of activity coefficient by electrochemical method. Debye Huckel limiting law – qualitative and quantitative verification – limitation of Debye Huckel limiting law at appreciable concentrations of electrolytes – Huckel equation – Debye – Huckel –Onsagarequation .

UNIT III – ELECTROCHEMISTRY- II

Electrode – electrolyte interface – adsorption at electrical interface – electrical double layer – electro capillary phenomenon – Lippmann equation – Structure of double layers – Helmholtz – Perrin, Guoy –Chappmann and Stern model of electrical double layers.

Diffusion – Fick's law of diffusion – Effect of ionic association on conductance-electrokinetic phenomena-membrane potential.

UNIT IV – MACROMOLECULES

Polymerization in homogeneous and heterogeneous phases- Kinetics of polymerization (Ionic and Addition)-kinetics of copolymerization- Mechanism of Polymerization-Chain Initiation- Propagation – Termination-Transfer –Inhibition and Retardation.

Properties of polymers : Molecular weight of polymers- M_w, M_n determination-Osmometry, Light Scattering, Viscosity, Ultracentrifuge – Gel Permeation Chromatography.

UNIT V – SPECTROSCOPY

Resonance spectroscopy – Zeeman effect – equation of motion of spin in magnetic fields – chemical shift – spin spin coupling - NMR of simple AX and AMX type molecules – calculation of coupling constants – ^{13}C, ^{19}F, ^{31}P NMR spectra – applications – a brief discussion of Fourier transformation resonance spectroscopy.

Text Books

1. R.K.Prasad,QuantumChemistry,WileyEastern,New Delhi,1992.
2. M.W.Hanna,Quantum Mechanics In Chemistry,W.A.Benjamin Inc.London,1965.
3. S.Glasstone,Introduction To Electrochemistry,Affliated East West Press ,New Delhi,1960.
4. D.R.Crow,Principles And Applications To Electrochemistry,Chapman And Hall,1991.
5. J.Rajaram And J.C.Kuriacose,Thermodynamics For Students Of Chemistry,LalNaginChand,New Delhi,1986.
6. F.W.Billmeyar,Text Book Of Polymer Science,Wiley Interscience,1984.
7. A.Rudin,The Elements Of Polymer Science And Engineering,An Introductory Text For Engineers And Chemists,AcademicPress,New York,1973.
8. G.Odian Principles Of Polymerization,McGraw Hill Book Company,New York,1973.
9. Caringtion and Ad.Mclachlan,Introduction To Magnetic Resonance Harper And Row,New York,1967.

Suggested Reference For Books

1. R.L.De Koch And H.B.Gray,Chemical Structure and Bonding,Benjamin/Cumming,MenloPark,California.
2. A.K.Chandra,Introductory Quantum Chemistry,TataMcgraw Hill.
3. J.M.Murrell,S.F.A.Kettle and J.M.Tedder,The Chemical Bond,Wiley,1985.
4. D.A.McQuarrie,QuantumChemistry,University Science Books, Mill Valley,California,1983.
5. P.W.Atkins,Molecular Quantum Mechanics,Oxford University Press,Oxford,1983.
6. J.O.M.Bokris and A. K. N Reddy,Electrochemistry,Vols 1and 2 Plenum,New York,1977.
7. P.Dalahay,Electrode Kinetics And Structure Of Double Layer,InterScience,New York,1965.
8. J.Robbins,Ions In Solution-An Introduction In Electrochemistry,Clarendon Press,Oxford,1993.
9. H.Reiger,Electrochemistry,Chapman And Hall,New York,1994.
10. I.C.E.H.Brawn,The Chemistry Of High Polymers,Butterworth And Co.,London,1948.
11. E.A.Coolins,J.Bares And E.W.Billmeyer,Experiments In Polymer Science,WileyInterscience,New York,1973.
12. G.S.Krishenbaum,Polymer Science Study Guide,Gordon Breach Science Publishing,New York,1973.

ORGANIC ESTIMATIONS
III SEMESTER – CORE PRACTICAL (30 HOURS)

PAPER CODE: P3CHPR31

ESTIMATIONS

1. Estimation of Aniline
2. Estimation of Phenol
3. Estimation of Glucose
4. Estimation of Amino group
5. Estimation of Amide group
6. Saponification of fat or an oil
7. Iodine value of an oil
8. Estimation of sulphur in an organic compound
9. Estimation of Ethyl Methyl Ketone

*CHROMATOGRAPHIC SEPARATIONS (Demonstration only)

Column chromatography - separation of anthracene and picric acid from anthracene picrate.
Thin layer chromatography separation of green leaf pigments.
Paper chromatography-Identification of amino acid.

* (Demonstration only)

Marks distribution

Procedure   : 10 marks
Titration   : 15 marks
Manipulation : 10 marks
Result   : 20 marks
Record   : 10 marks
Viva   : 10 marks
Total   : 75 Marks

Note:
External   75 Marks
Internal   25 Marks
Total   100 Marks

RECOMMENDED BOOKS

1. A text book of Practical Organic Chemistry by Arthur I.Vogel
2. Laboratory Manual of Organic Chemistry Raj K. Bansal, Wiley Eastern limited.
3. Laboratory manual of Organic Chemistry by Mann and Saunders.

QUANTITATIVE ANALYSIS OF METAL ION – I AND COMPLEX PREPARATION

III SEMESTER – CORE PRACTICAL (30 HOURS)

PAPER CODE: P3CHPR32

I QUANTITATIVE ANALYSIS

Quantitative analysis of mixtures of   (i) Copper and Nickel
(ii) Copper and Zinc.

II PREPARATIONS

1) Tetrammine copper (II) sulphate
2) Potassium tetrachlorocuprate(II)
3) Tris (ethylenediammine) Cobalt (III) chloride
4) Hexammine Cobalt (III) chloride

SCHEME

PREPARATION	10 Marks
VOLUMETRIC	20 Marks
GRAVIMETRIC	20 Marks
PROCEDURE	05 Marks
RECORD	10 Marks
VIVA VOCE	10 Marks
Total	75 Marks

RECOMMENDED BOOKS

1. Vogel's Text book of Quantitative Inorganic Analysis.

CONDUCTOMETRIC TITRATIONS AND SPECTRAL INTERPRETATION
PAPER CODE:P3CHPR33

List of Experiments

1. Determination of strength of an unknown strong acid by using a standard base.
2. Determination of strength of the individual concentrations of the two acids in the mixture (Strong and weak) by using a standard strong base.
3. Determination of strength of an unknown weak acid by using a standard base.
4. Analysis of an unknown KI using a standard silver nitrate by precipitation method.
5. Determination of strength of KCI by using a standard silver nitrate solution by precipitation method.
6. Analysis of a mixture of KCI and KI (individual concentrations) by using standard silver nitrate solution.
7. Determination of strength of barium chloride by using a standard magnesium sulphate by precipitation method.
8. Determination of strength of barium hydroxide by using a standard magnesium sulphate by double precipitation method.
9. Verification of Ostwald's dilution law using not less than five different dilute solutions of weak acid and determination of dissociation constant of weak acid.
10. Determination of Equivalent conductance ($\lambda\alpha$) at infinite dilution of strong electrolyte using five different dilutions using Debye –Huckel Onsager's equation.
11. Determination of solubility of a sparingly soluble salt by conductance method.

SPECTROSCOPY:

Interpretation of simple IR and Raman spectra of simple molecules for the calculation of molecular data and identification of functional groups.

Total Marks: 100 (External 75 + Internal 25)
External marks distribution

Spectra (5+5)	=	10
Practical	=	40
Procedure	=	05
Record	=	10
Viva-voce	=	10

SEMESTER III

ORGANOMETALLICS & COMPUTATIONAL CHEMISTRY (90 HOURS)
NON MAJOR -1

PAPER CODE: P3CHNM31

OBJECTIVES:

To apprise the students about the latest trend in Theoretical chemistry and make them computer literate with expertise in subjects such as quantum chemistry and also make them learn about the organometallics which are highly used as catalysts in the industry.

UNIT I
ORGANOMETALLIC CHEMISTRY I

Synthesis, structure and bonding: Anionic sigma donors – alkyls and aryls; neutral sigma donors – carbonyls and nitrosyls; chain pi donors – olefins , acetylenes and allyls; cyclic pi donors – metallocenes. Reactions: Association – ligand protonation; Substitution – electrophilic and nucleophilic attack on ligands; Addition and elimination – carbonylation and decarbonylation; Rearrangements – oxidative addition and reductive elimination.

UNIT II
ORGANOMETALLIC CHEMISTRY II

Catalysis: Hydrogenation of olefins [Wilkinson`s catalyst], hydroformylation of olefins using cobalt and rhodium catalysts [Oxo process], oxidation of olefins to aldehydes and ketones [Wacker`s process] Polymerization of olefins [Zeigler-Natta catalyst], cyclooligomerisation of olefins and acetylenes [Reppe`s andWilke`s catalyst], polymer bound catalysts.

UNIT III
PHOTOCHEMISTRY AND OCTAHEDRAL COMPLEXES

Inorganic Photochemistry: Photosubstitution, Photoredox and isomerization process, application of metal complexes in solar energy conversions.

Substitution of Octahedral complexes of Cobalt and Chromium, replacement of coordinated water, solvolysis (acids and bases) reaction applications in synthesis.

UNIT IV
COMPUTATIONAL CHEMISTRY –I

Basics about Computers: Hardware and Software definitions. Languages – Higher level and lower level. Basics on Internet: DNS, ISP, DSL, http, www, URL, LAN and WAN, repeater, Modem. Open Source software resources on web.

Fundamentals of Computational Chemistry: Semi-empirical and Ab-initio methods, Molecular Mechanics and Density Functional Theory (Basic Definitions) and Examples of Software related to these such as MOPAC and Gaussian (Or GAMESS). Visualization of results, properties predictable and Significancewith few examples

(MESP, HOMO, LUMO, Mulliken and Lowden Charges). Quantitative Structure Activity Relationship - basics.

UNIT V
COMPUTATIONAL CHEMISTRY –II
Drawing of structure using free softwares (Chemdraw, Chemsketch and their scope), saving them in formats and conversions (OpenBabel). Construction of zmatrix of some simple molecules such as water, formaldehyde, methane and ethane.
Predicting Molecular Geometry and optimization. Input formats to include, Cartesian coordinates and unique coordinates, Smiles, mol, pdb, mop, arc, out, dat, gjf, inp and punch files. Quantum Chemical Descriptors, Fukui Function, Calculation of Chemical Potential, Electron Affinity, Hardness and Softness, and other properties- FMO Approach.

Text books and References:
1. Computational Chemistry – A practical guide for applying techniques to real world problems – David Young, Wiley Interscience, ISBN-0-471-33368-9.
2. Essentials of Computational Chemistry, Theories and Models – Christopher J Cramer, Wiley, ISBN: 0-470-09182-7.
3. Computational Chemistry – Introduction to the Theory and Applications of Molecular and Quantum Mechanics, Springer, ISBN: 978-81-8128-476-1.
4. Computational Organic Chemistry, Steven M Bachrach, Wiley Interscience, ISBN: 978-0-471-71342-5.
5. Inorganic Chemistry, Gary Wulfsberg, Viva books pvt. Ltd. ISBN: 81-7649-288-4.
6. Molecular Modelling – Principles and Applications, Andrew R Leach, Pearson Education Ltd. ISBN:978-0-582-38210-7.
7. Bio-informatics, S C Rastogi, N Mendiratta and P Rastogi, Prentice Hall India, ISBN:978-81-203-3595-0.
8. Computational Medicinal Chemistry for Drug Discovery, Edited by P Bultinck, H De Winter, W langenaeker and J P Tollenaere, Marcell Dekker, ISBN: 0-8247-4774-7.
9. Physical Chemistry- A molecular Approach, Donald A MQuarrie and John D Simon, Viva books pvt ltd. ISBN: 81-7649-001-6.
10. Computers in Chemistry, AV Raman,Tata McGraw Hill, ISBN: 0-07-460123-7.

SPECTROSCOPY & APPLIED INORGANIC CHEMISTRY (90 HOURS)

PAPER CODE: P3CH4001

OBJECTIVES

To make the students learn about the applications of Spectroscopy of Inorganic compounds that are now a days used for characterization of materials and compounds. This unit also would make them learn about the latest subjects such as nano science.

UNIT I

UV VISIBLE AND X-RAY SPECTROSCOPY

Applications to inorganic systems of the following: ultra violet, visible. Term symbols, energies of atomic and Molecular transitions, Selection rule, Morse potential energy diagram, charge transfer spectra, Photoelectron spectroscopy [UV and X ray]- Koopman`s theorem, time structure in PES, chemical shift and correlation with electronic charges, Auger Effect.

UNIT II

IR AND RAMAN SPECTROSCOPY

Infra red and Raman spectra: Selection Rules, use of Symmetry considerations (point groups) to determine the number of lines in IR and Raman Spectra. Applications to metal complexes, Organometallic compounds, Metal carbonyls and simple inorganic compounds with special reference to coordination site, isomerism. Metal-Ligand stretching vibrations for metal carbonyls, sulphates, cyanides, isocyanides nitro and nitrito complexes

UNIT III

NMR, NQR, MOSSBAUER AND ESR SPECTROSCOPY

NMR, NQR and Mossbauer spectra – NMR of P^{31}, F^{19}, N^{15}; shift reagents, NQR – principle and applications; Mossbauer spectra – principles and applications to iron and tin systems.

ESR – Introduction- Zeeman equation, g-value, nuclear hyperfine splitting, interpretation of the spectrum, simple carbon centered free radicals. Anisotropy – McConnel`s equation. Kramer`s theorem, ESR of transition metal complexes of copper, manganese and vanadyl complex

UNIT IV

LANTHANIDES AND ACTINIDES – NANOTECHNOLOGY

The chemistry of lanthanides and actinides- oxidation states, spectral and magnetic characteristics, coordination numbers, stereochemistry, nuclear and non-nuclear applications.

Nanotechnology - introduction, preparatory methods, characterization, application as sensors, biomedical applications, application in optics and electronics.

UNIT V

BIOINORGANIC CHEMISTRY

Biological importance of Iron, Magnesium, Zinc, Cobalt, Copper, Sodium, Potassium and Calcium.Iron; heme and non-heme proteins – haemoglobin, myoglobin, iron-sulphur proteins, catalase and peroxidase, transport mechanism. Magnesium: chlorophyll, salient features of the photosynthesis. Zinc: metalloenzymes – carbonic anhydrase and carboxypeptidase. Cobalt: cobalamines, coenzymatic actions; Copper proteins; biological functions of Na, K and Ca. Nitrogen fixation – nitrogen cycle.

TEXT BOOKS AND REFERENCES:
1. F.A. Cotton and G. Wilkinson - Advanced Inorganic Chemistry, John Wiley and Sons (1988) V Edition.
2. K.F. Purcell and J.C. Kotz - Inorganic Chemistry, WB Saunders Co., 1977.
3. R. Drago - Physical methods in inorganic Chemistry, Reeindhod, NY, 1968.
4. C.N.R. Rao, I.R. Fellalo - Spectroscopy in Inorganic Chemistry, Vol. I and Vol. II, Academic Press, 1970.
5. K. Burger - Coordination Chemistry, Experimental methods, Butterworths, 1973.
6. G. Aruldhas - Molecular Structure and Spectroscopy - Prantice Hall.
7. N. Greenwood and A. Earnshaw - Chemistry of Elements pergamon, NY, 1984.4.
8. G.T. Seaborg, J. J. Katz - The Chemistry of Acitinide Elements, Metheun, 1957.
9. G.T. Seaborg - Transuranium elements, Dowden Hitchinson and Ross, 1978.
10. K. Hussain Reddy - Bioinorganic Chemistry, , New Age International Publishers, Delhi , 1978.
11. ManasiKarkare - Nanotechnology, Fundamentals and Applications, I.K international,Royal Society of Chemistry, 2nd edition, 2005.
12. Geoffry.AOzin, Andre C Arsenault- Nanochemistry, A chemical approach a nano materials,2005.
13. Stephen. J. Lippard, Jeremy. M. Berg – Principles of BioInorganic Chemistry, University Science books, 2008.

IV SEMESTER

ELECTRO, THERMAL AND PHOTO DYNAMICS (90 HOURS)

OBJECTIVE:
To study the electrochemical kinetics, over potential, corrosions and fuel cells. To study statisticalthermodynamics, Quantum statistics and reversible thermodynamics.To study the principle of photochemical reactions, kinetics – Stern-Volmer Analysis.

UNIT I – ELECTROCHEMISTRY

Mechanism of electrode reactions – polarization and overpotential – the Butler-Volmer equation for one step and multistep electron transfer reactions – significance of electron exchange current density and symmetry factor – transfer coefficient and its significance – mechanism of the hydrogen and oxygen evolution reactions.

Corrosition and passivation of metals – Pourbaix diagram – Evan's diagram – fuell cells – electrodeposition- principle and applications- electrochemical inorganic reactions of technological interest.

UNIT II – STATISTICAL THEMODYNAMICS - I

Objectives of statistical thermodynamics – concept of thermodynamics and mathematical probabilities – distribution of distinguishable and non-distinguishable particles.

Maxwell–Boltzmann distribution law – Partition function – evaluation of translational, vibrational and rotational partition functions for mono, diatomic and polyatomic ideal gases – thermodynamic functions in terms of partition functions-application of partition function to heat capacity of ideal gases- nuclear partition function –Heat capacity of solids(Eienstein's and Debye's) ortho and para hydrogen.

UNIT III – STATISTICAL THEMODYNAMICS - II

Fermi - Dirac and Bose - Einstein statistics - comparison with Maxwell–Boltzmann distribution law and their applications – radiation laws .(Planck's, Wien's and Stefan Boltzmann's)
Irreversible Thermodynamics – Forces and fluxes – linear force, flux relation – phenomenological equations.

UNIT IV – PHOTOCHEMISTRY – I

Absorption and emission of radiation – Franck – Condon Principles – decay of electronically excited states – Jablonski diagram - radiative and non radiative processes – fluorescence and phosphorescence – spin forbidden radiative transition – internal conversion and intersection crossing – energy transfer process – kinetics of

unimolecular and bimolecular photophysical processes-excimers and exciplexes – static and
dynamic   quenching   –   Stern-Volmerequation.

UNIT V – PHOTOCHEMISTRY - II

Experimental methods – quantum yield and life time measurements – steady state principle – quantum yield and chemical actinometry. kinetics of photochemical reactions : hydrogen and halogen reactions, photoredox , photosubstitution, photoisomerization and photosensitized reactions– photovoltaic and photogalvanic cells, photoelectrochemical cells, photo assisted electrolysis of water, aspects of solar energy conversion.

TEXT BOOKS
1. S.Glasstone,Introduction To Electrochemistry,Affliated East West Press ,New Delhi,1960.
2. R.Crow, Principles and Applications to Electrochemistry,Chapman And Hall,1991.
3. P.H.Rieger ,Electrochemistry,Chapman And Hall,New York,1994.
4. M.C.Gupta,Statisticaltheromdynamics,WileyEaster,New Delhi,1990.
5. R.Hasee,Thermodynamics Of Irreversible Process,Addition Wesley,Reading,Mass,1969.
6. N.J.Turro,Modern Molecular Photochemistry,Benjamin,Cumming,Menlo Park,California,1978.
7. K.K.RohatgiMukherjee,Fundamentals Of Photochemistry,Wiley Eastern Ltd.,1978.
8. S.Glasston,Text Book Of Physical Chemistry.

SUGGESTED REFERENCE FOR BOOKS
1. J.O.M.Bokris And Ak.NReddy,Electrochemistry,Vols 1and 2 Plenum,New York,1977.
2. P.Dalahay,Electrode Kinetics And Structure Of Double Layer,InterScience,New York,1965.
3. J.Robbins,Ions In Solution-An Introduction In Electrochemistry,Clarendon Press,Oxford,1972.
4. C.M.A.Brett And As.MsO.Brett,ElectrochemistryPrinciples,Methods And Applications,Oup,Oxford,1993.
5. Dole,Themodyanamics,PrenticeHall,New York,1954.
6. B.J.McClenlland,StatisticalThermodyanamics,Chapman And Hall,London,1973.
7. I.Prigogine,Introduction To Themodyanamics Of Irreversible Process,Interscience,New York,1961.
8. N.O.Smith,Elementary Statistical Thermodyanamics,A Problem Approach,PlenumPress,New York,1961.
9. Cleyde,PhysicalChemistry,SchaumSeries,McGraw Hill,1976.
10. Seans,StatisticalThermodyanamics,Salinyar And Tangodie.
11. J.G.Clavert and J.N.Pitts,Photochemistry,Wiley,London,1966.
12. R.P.Wayne,Photochemistry,Butterworths,London,1970.
13. R.Cundell and A.Gilbert,Photochemist Thomas Nelson,10

IV SEMESTER

MODERN SYNTHETIC ORGANIC CHEMISTRY, VITAMINES & FREE RADICALS   ELECTIVE PAPER - (90 HOURS)

PAPER CODE: P3CHE401

OBJECTIVE:
To know modern synthetic methods and synthetic strategies. This help in planning the synthesis of any types of organic compounds.
To learn the importance of proteins, vitamins and free radicals

UNIT I – MODERN SYNTHETIC METHODS, REACTIONS AND REAGENTS

Principles and synthetic processes involving phase transfer catalysis, (Nitriles from Alkyl halides, Alcohol from Alkyl halides) polymer supported reagents (synthesis of oligo saccharides), micro wave assisted reaction, esterification, deacetylation and hydrolysis.

Synthesis of simple organic molecules using standard reaction like acetylation alkylation of enamines and active methylene compounds, Grignard reactions, Phosphorus and sulphurylides Robinson annulation, Diels Alder reactions, protection and deprotection of functional groups (R-OH, R-CHO, RCO-R, R-NH$_2$ and R-COOH). Uses of the following reagents: DCC, Trimethylsilyliodide, 1, 3-Dithiane (umpolung), diisobutylaluminimumhydride (DIBAL), 9BBN, Trimethylsilylchlorode.

UNIT II –RETROSYNTHETICANALYSIS

An introduction to retrosynthesis – Synthon, Synthetic equivalent, Target molecule, Functional group interconversion – Disconnection approach – One group disconnection – Disconnection of alcohols, olefins and ketones – Logical and illogical disconnections, Two group disconnection – 1,2 – 1,3 – 1,4 – 1,5 – and 1,6 – deoxygenated skeletons and dicarbonyls. Retro Diels Alder reaction – pericyclic reactions – Retrosynthesis of some heterocyclescontaining nitrogen atoms. (not exceeding two nitrogen atoms as examples)

UNIT III - SYNTHESIS OF ORGANIC COMPOUNDS

Synthesis of longifolene, cubane, 5 hexenoic acid, trans-9-methyl-1- decalone, bicycle[4:1:0] – hept-2-one and α onocerin.

UNIT IV - PROTEINS, VITAMINS AND TERPENES.

PROTEINS: Peptides and their synthesis - synthesis of tripeptide. Merrifield synthesis, Determination of tertiary structure of proteins.
VITAMINS: Synthesis of vitamin AI (Reformatsky and Wittig reaction methods only).
TERPENES: Introduction, classification, isoprene rule, structural determination of Geraniol, α-pinene and camphor.

UNIT V – FREE RADICALS

Long and short-lived free radicals, methods of generation of free radicals.Addition of free radicals to olefinic double bonds. The following aromatic radical substitutions are to be studied: decomposition of diazocompounds, phenol - coupling - Sandmeyer reaction Gomberg reaction, Pschorrreation, Ulmann reaction, mechanism of Hunsdiecker reaction.

RECOMMENDED BOOKS

1. Guide book to Organic synthesis by Ramond K. Mackie and David M. Smith, ELBS Publication.
2. Organic Chemistry V Edition, 1986, VolII by I.L. Finar, ELBS Publication
3. Outlines of Biochemistry V Edition by Eric E. Conn, Paul. R. Stumpf, George Bruening and Roy H. Dole, John Wiley and Sons.
4. Principles of Biochemistry General aspects by L. Smith, Robert L. Hill I. Robert Lehman, Robert J. Let Rowitz, Philip Handlar and Abrahim white. McGraw Hill Int. (7th Edition)
5. Biochemistry by LubertStryer, WH. Freeman and Co., New York
6. Chemistry of organic natural products by Agarwal, Geol Publishing House.
7. Organic synthesis by R.E. Ireland, Prentice Hall of India, Geol Publishing House.
8. Principles of Organic synthesis by R.O.C. Norman, Champan and Hall, NY, 1980.
9. Advanced Organic Chemistry by Francis. A. Carey Richard J. Sundberg, 3rd Edition, Plenum, Press, New York, 1990.
10. Advanced Organic Chemistry by Jerry March, IV edition Wiley Eastern Ltd., New Delhi.
11. Organic Chemistry, 6th Edition, 1992. RT.Morrison, R.S. Boy, Prentice Hall of India Pvt. Ltd., New Delhi.
12. Organic synthesis by Michael Smith
13. Organic Chemistry by House.
14. Micheal B. Smith, Organic Syntheis, McGraw Hill, International Editor, 1994.
15. Stuart Warren, Work book for organic synthesis, The Disconnection Approach John Wiley & Sons (Asia) Pvt. Ltd.,
16. W. Carruther, Jain Coldham, Modern Methods of organic synthesis, 4th Edition.

IV SEMESTER – CORE PRACTICALS

ORGANIC PREPARATIONS & SPECTRAL INTERPRETATION (30 HOURS)
PAPER CODE: P3CHPR41

OBJECTIVE:
To learn the preparative techniques of Organic compounds and interpretation of spectras.

ORGANIC PREPARATIONS
1. sym-Tribromo benzene from aniline.
2. Benzanilide from benzophenone
3. m-Nitro benzoic acid from methyl benzoate
4. 2,4.- Dinitrobenzoic acid from p-nitrotoluene
5. m-Nitro benzoic acid from benzaldehyde
6. Benzil form benzaldehyde
7. Anthraquinone from phthalic anhydride
8. Phthalide from phthaic anhydride
9. 2-Phenyl indole from phenyl hydrazine
10. 2, 4 dinitrophenyl hydrazine from p-nitrochlorobenzene

SPECTRAL INTERPRETATION OF ORGANIC COMPOUNDS UV, IR, PMR AND MASS SPECTRA OF COMPOUNDS
1. 1,3,5- Trimethyl benzene
2. Pinacolane
3. n-Propylamine
4. p-Methoxy benzyl alchol
5. Benzyl bromide
6. Phenylacetone
7. 2-Methoxyethyl acetate
8. Acetone
9. Isopropyl alcohol
10. Acetaldehyde diacetate
11. 2-N,N-Dimethylamino ethanol
12. Pyridine
13. 4-Picoline
14. 1,3-dibromo - 1, 1- dichloropropene
15. Cinnamaldehyde

Spectra	:	15 marks
Preparation	:	30 marks
Recrystallization	:	10 marks
Viva Voce	:	10 marks
Record	:	10 marks
Total	:	75 marks

Note:
External	75 Marks
Internal	25 Marks
Total	100 Marks

RECOMMENDED BOOKS

1. A text book of Practical Organic Chemistry by Arthur I.Vogel
2. Laboratory Manual of Organic Chemistry Raj K. Bansal, Wiley Eastern limited.
3. Laboratory manual of Organic Chemistry by Mann and Saunders.

IV SEMESTER

QUANTITATIVE ANALYSIS OF METAL ION -II AND SPECTRAL INTERPRETATION
(30 HRS)

PAPER CODE: P3CHPR42

I QUANTITATIVE ANALYSIS

Quantitative analysis of mixtures of   (i) Iron and Magnesium
                       (ii) Iron and Nickel

II LIST OF SPECTRA TO BE GIVEN FOR INTERPRETATION.

P^{31} NMR Spectra of methylphosphate
P^{31} NMR Spectra of HPF_2
F^{19} NMR Spectra of CIF_3
H^1 NMR Spectra of Tris (ethythioacctoacetanato) cobalt (III)
ESR Spectra of the aqueous $ON(SO_3)^{2-}$ ion.
ESR Spectra of the H atoms in CaF_2.
ESR Spectra of the $[Mn(H_2O)_6]^{2+}$.
ESR Spectra of the bis (salicyladiminato) copper (II)
IR Spectra of the sulphato ligand.
IR Spectra of the dimethylglyoxime ligand and its Nickel (II) complex.
IR Spectra of carbonyls
Mossbauer spectra of $FeSO_4 \, 7H_2O$
Mossbauer spectra of $FeCl_3$.
Mossbauer spectra of $[Fe(CN)_6]^{3-}$
Mossbauer spectra of $[Fe(CN)_6]^{4-}$

SCHEME

SPECTRA	10 Marks
VOLUMETRIC	20 Marks
GRAVIMETRIC	20 Marks
PROCEDURE	05 Marks
RECORD	10 Marks
VIVA VOCE	10 Marks
Total	75 Marks

RECOMMENDED BOOKS

1. Vogel's Text book of Quantitative Inorganic Analysis

SEMESTER-IV

POTENTIOMETRIC TITRATIONSAND SPECTRAL INTERPRETATION (90 HOURS)

PAPER CODE: P3CHPR43

List of Experiments

1. Determination of strength of an unknown strong acid by using a standard base.
2. Determination of strength of an unknown weak acid by using a standard base.
3. Determination of strength of the individual concentrations of the two acids in the mixture (Strong and weak) by using a standard strong base.
4. Determination of strength of FAS by using a standard potassium dichromate (redox titration).
5. Determination of strength of KI by using a standard potassium permanganate.
6. Determination of strength of ferrous sulphate by using a standard potassium dichromate (redox titration).
7. Determination of strength of sodium chloride by using a standard silver nitrate solution.
8. Determination of strength of KI by using a standard silver nitrate solution.
9. Determination of strength of individual concentrations of mixture of halides (KCI+KI) using standard silver nitrate solution.
10. Determination of P^H of different buffer solutions by emf method.
11. Determination of strength of weak acid by using a standard base and from the titration curve, the emf at ¼, 1/3, 1/2, 2/3 and ¾ neutralization and hence the dissociation constant of a given weak acid is calculated.

SPECTROSCOPY:

Interpretation of simple UV – Visible, NMR and ESR spectra of simple molecules for the
calculation of molecular data and identification of functional groups.

Total Marks: 100 (External 75 + Internal 25)

External marks distribution	
Spectra (5+5)	10
Practical	40
Procedure	05
Record	10
Viva-voce	10

ADVANCED ACCOUNTING – I
(Subject Code: P3CO3001)
(5 Hours)

UNIT – I: Accounting Standards

Accounting Standards: Meaning – Objectives – Significance – Need for Accounting Standards – International Accounting Standards: IAS-1, IAS-27 and IAS-30 – Company Final Accounts – Divisible Profits – Form of Balance Sheet – Preparation of Balance Sheet.

UNIT – II: Valuation of 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 Assets, Yield and Fair Value Methods.

UNIT – III: Amalgamation, Absorption and External Reconstruction

Amalgamation – Absorption and External Reconstruction of a Company (Inter Company Investment excluded)

UNIT – IV: Internal Reconstruction

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

UNIT – V: Accounting for Price Level Changes

Accounting for Price Level Changes: Need and Objectives – Current Purchasing Power Method – Current Cost Accounting Method.

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

Reference Books:
1. M.C. Shukla and T.S Grewal – Advanced Accounts – S.Chand & Co. New Delhi.
2. R.L Gupta and Radhasamy – Advanced Accounts – Sultan Chand & Sons, New Delhi.
3. Jain and Narang – Advanced Corporate Accounting – Kalyani Publishers, New Delhi.
4. T.S Reddy and Murthy – Corporate Accounting – Margham Publication, Chennai
5. S.N Maheshwari – Advanced Corporate Accounting – Vikas Publication.

ADVANCED COST ACCOUNTING – I
(Subject Code: P3CO3002)
(5 Hours)

UNIT – I: Introduction

Meaning of Cost Accounting – Functions of Cost Accounting – Objectives of Cost Accounting – Advantages and Limitation of Cost Accounting – Installation of Costing System - Costing an Aid to Management – Cost Accounting Vs. Financial Accounting – Cost Unit – Cost Centre and Profit Centre – Methods of Costing – Types of Costing – Cost Sheet, Tenders and Quotations.

UNIT – II Material Costing

Materials: Meaning of Material Control – Objectives of Material Control – Stock Control through ABC Analysis – Standard Price – Base Stock Method – Stock Levels – EOQ – Periodic & Perpetual Inventory System - Methods of Valuing Material Issues – FIFO – LIFO – Simple Average – Weighted Average Method.

UNIT – III: Labour Costing

Labour Cost: Control over Labour Cost – Labour Turnover Rate – Causes of Labour Turnover – System of Wage Payment – Time Wage System, Piece Rate System, Premium and Bonus Plan – Taylor's Differential Piece Rate System – Halsey Premium Plan – Merrick's Multiple Piece Rate System – Rowan Plan.

UNIT – IV: Overheads

Overheads: Definition – Classification – Basis of Apportionment – Methods of Reapportionments – Direct Redistribution Method – Step Distribution Method – Reciprocal Distribution Method – Simultaneous Equation Method – Repeated Distribution Method.

UNIT – V: Reconciliation of Cost and Financial Profits

Reconciliation of Cost and Financial Profits – Need for Reconciliation – Reasons for Disagreement in Profit.

Reference Books:

1. S.P Jain & K.L Narang – Cost Accounting, Kalayani Publishers.
2. R.S.N Pillai & V. Bagavathi – Cost Accounting, S.Chand & Co., New Delhi.
3. Nigam & Sharma – Cost Accounting –Principles and Application, Himalaya Publishers
4. Dr. Reddy & Hari Prasad Reddy, Cost Accounting, Margham Publications, Chennai.
5. Dr. A. Murthy & Dr. S. Gurusamy, Cost Accounting, Vijay Nicole Publications, Chennai.

ORGANISATIONAL BEHAVIOUR
(Subject Code: P3CO3003)
(5 hours)

Unit I: Introduction

Organisational Behaviour – Definition – Nature – Need - Scope – Elements – Process – Models – Theories – Foundations of Individual Behaviour – Personality – Perception – Attitude – Learning – Values

Unit II: Motivation

Motivation – Theories by Maslow, Herzberg, McGregor, McClelland & Vroom – Motivational tools – Incentives – Job Design – MBO – Motivation and Morale - Organisational Citizenship Behaviour

Unit III: Group Dynamics and Stress Management

Group Dynamics – Group Behaviour – Characteristics and Types of Groups – Group Decision making – Inter Group Behaviour – Quality Circles – Work Stress – Stress Management.

Unit IV: Leadership and Organisational Conflicts

Leadership – Functions – Styles – Theories – Transactional and Transformational Leadership – Emotional Intelligence as a managerial tool – Organisational Conflicts – Sources – Types – Conflict Management

Unit V: Organisational Structure and Design

Organisational Structure and Design – Organisational Culture and Climate – Power and Politics – Organisational Change – Resistance to Change Organisational Development – Organisational Effectiveness – Organisational Ethics

Reference Books:

1. S.S. Khanka, Organisational Behaviour, S.Chand & Co. Ltd., New Delhi.
2. Stephen P. Robbins, Organizational Behavior, Pearson Education, New Delhi.
3. Margie Parikh and Rajen Gupta, Organisational Behaviour, Tata McGraw Hill Education.
4. K. Aswathapa, Organisational Behaviour, Himalaya Publishing House.
5. L.M. Prasad, Organisational Behaviour, Sultan Chand and Sons, New Delhi.

RESEARCH METHODOLOGY
(Subject Code: P3CO3004)
(5 Hours)

UNIT I: Introduction
(Theory Only)

Research-Definition- Scope of Research--Significance of research in Social Science-Types of Research-Formulation of Research Problem-Research Design

UNIT II: Sampling and Data Collection
(Theory Only)

Sampling - Meaning, Definition, Need & Types - Sampling Errors. Data collection: sources of data - Primary and Secondary Data-Procedure for Data Collection-Tools of Data Collection-Questionnaire and Interview Schedule

UNIT III: Data Processing
(Theory Only)

Processing of Data- Editing, Coding and Tabulation- Uses of Computer in Social Research- Diagrammatic and Graphic Representation-Interpretation of Results.

UNIT IV: Data Analysis   (Both Theory & Problems)

Data Analysis - Analysis of Quantitative Data - Descriptive statistics - Tests of Significance - Parametric Tests and Non-Parametric Tests - Chi-square Test –ANOVA - Application of SPSS for Data Analyses.

UNIT V: Report Writing
(Theory only)

Report Writing - Significance of Report Writing - Different steps in writing Report - Layout of Research Report – Types - Technical Report - Popular Report -Mechanics of writing a report.

Note: One Problem in Section B only

Reference Books:
1. C.R.Kothari, Research Methodology: Methods and Techniques, Wiley Eastern.Ltd, New Delhi.
2. D. Amarchand, Research Methods in Commerce, Emerald Publishers, Chennai.
3. Anderson,R.L., Berry H.D., Poole,M, Thesis and Assignmnet Writing, Wiley Eastern Ltd, New Delhi.
4. Ravilochanan, Research Methodology, Margham Publications, Chennai.
5. S.P.Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi.

INDIRECT TAXES
(Subject Code: P3COE501)
(6 Hours)

UNIT – I: Introduction

Indirect Taxes – Meaning – Features –Types of Indirect Taxes – Canons of Taxation – Advantages and Dis Advantages – Levy and Collection - Bases of Excise Duty - Highlights of Latest Finance Act 2011 **-** Excisability of Manufacturer – Concept of Goods – Excisable Goods – Concept of Manufacturer – Definition of Manufacturer under Excise Act – Valuation of Excisable Goods – Rate of Duty – Transaction Rule – Clearance of Excisable Goods.

UNIT – II: Excise Duty

Excise Duty – Types of Excise Duty – Methods of Levy – Bases of Duty – Clearance of Goods, Warehousing – CENVAT – Features of CENVAT – Conditions for availing CENVAT Credit – Excise and Small Industries – Excise and Exports.

UNIT –III: Customs Duty

Customs Duty – Historical Background – Levy and Collection - Provision relating to Detection and Prevention of Illegal Exports and Imports – Valuation of Goods Under Customs Act – Exemption – Clearance of Imports/Export goods – Warehousing – Duty Drawback – Green Channel and Red Channel – Customs Duty on Baggage Goods, Postal articles and Stores – Search, Seizure and Confiscation of Goods – Approach – Prosecutions.

UNIT – IV: Value Added Tax

TN Value Added Tax (VAT) – Introduction – Meaning – Objectives – Types – Computation of TN VAT – Pros and Cons of VAT.

UNIT – V: Service Tax

Service Tax – Introduction – Meaning – Salient features – Objectives – Scope – Administrative Machinery – Services covered under Services Tax – Service Tax Exemptions – Filing of returns - Assessment Procedure – Self Assessment, Provisional Assessment and Best Judgement Assessment.

Reference Books:
1. Dr. V. Balachandran, Indirect Taxation , Sulthan Chand , New Delhi.
2. Dr. H.C. Mehrotra & Prof. V.C. Agarwall, Indirect Taxes, Bawan Publications
3. T.S. Reddy & Y. Hari Prasad Reddy, Business Taxation, Margham Publications, Chennai.
4. S. Gopalan, Indiret Taxes made easy, Seetharam Publications, Chennai
5. Gupta SS, Service Tax – How to meet your obligations? Taxmann, New Delhi

COMPUTER APPLICATIONS IN BUSINESS
(Subject Code: P3CONM31)
(4 Hours)

UNIT I: Introduction

Computers – Meaning - Characteristics of Computer – Computer Generations – Classification of Computers – Areas of Computer Applications – Computer Peripherals – Input Devices, Output Devices and Auxiliary Storage Devices

UNIT II: Word Processing

Meaning – Basic Word Processing Features – Microsoft Word – Features of MS Word – Working with Documents – Editing Documents – Formatting Documents – Language Tools – Working with Tables – Mail Merge – Printing a Document.

UNIT III: Spreadsheet and Presentation Tools

Spreadsheet: Meaning – Features – Application Areas – Microsoft Excel – Basic Features – Screen Elements – Moving Around Worksheet – Working with a Spread Sheet.

Presentation Tool: MS Powerpoint – Basic Features and Enhanced Features – Starting Powerpoint – Creating a Presentation Slide – Editing and Formatting Text in a Slide – Printing of Presentation.

UNIT IV: Internet

Meaning – Objectives – Uses – Working of Internet – Internet vs. Intranet – Electronic Mail – World Wide Web – Meaning, Features and Functions.

UNIT V: E-Commerce

Definition, Benefits and Limitations – E-Commerce Applications – Telecommunicating – Teleconferencing – Teleworking – E-Marketing – E-Banking.

Reference Books:
1. Alexis Leon & Mathews Leon, Computer Applications in Business, Vijay Nicole Imprints Pvt.Ltd., Chennai.
2. Peter Norton, Introduction to Computers, Tata McGraw Hill, Publishing Co., Ltd.,   New Delhi.
3. Srinivas Vallabhan SV, Computer Applications in Business, Sultan Chand & Sons,   New Delhi.
4. Kapoor VK, Computers and Information Technology, Sultan Chand & Sons, New Delhi.
5. Ananthi Sheshasaayee & Sheshasaayee, Computer Applications in Business and Management, Margham Publications, Chennai.

ADVANCED ACCOUNTING – II
(Subject Code: P3CO3001)
(6 Hours)

UNIT – I: Liquidation Accounting

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

UNIT – II: Holding Company Accounts

Holding Company Accounts: Legal Definition and Requirements – Consolidation of Profit and Loss Accounts – Consolidation of Balance Sheet.

UNIT – III: Accounts of Banking Companies

Accounts of Banking Companies: Legal Provisions – Rebate on Bills Discounted – NPA – Preparation of Profit and Loss Account and Balance Sheet.

UNIT – IV: Insurance Company Accounts

Insurance Company Accounts: Accounts of Life Insurance Business – Accounts of General Insurance Business – IRDA Regulations – Preparation of Final Accounts

UNIT – V: Human Resource Accounting and Social Responsibility Accounting

Human Resource Accounting – Need and Development – Importance – Objections against Human Resource Accounting. Social Responsibility Accounting – Meaning and Definition – Objectives – Approaches and Methods – Social Income statement and social Balance sheet

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

Reference Books:
1. M.C. Shukla and T.S Grewal – Advanced Accounts – S.Chand & Co. New Delhi.
2. R.L Gupta and Radhasamy – Advanced Accounts – Sultan Chand & Sons, New Delhi.
3. Jain and Narang – Advanced Corporate Accounting – Kalyani Publishers, New Delhi.
4. T.S Reddy and Murthy – Corporate Accounting – Margham Publication, Chennai
5. S.N Maheshwari – Advanced Corporate Accounting – Vikas Publication.

ADVANCED COST ACCOUNTING – II
(Subject Code: P3CO4002)
(6 Hours)

UNIT – I: Job, Batch and Contract Costing

Job Costing – Batch Costing – Contract Costing – Preparation of Contract Account – Work Certified – Work Uncertified – WIP Valuation – Cost Plus Contract and Escalation Clause

UNIT – II: Process Costing

Process Costing - Meaning and Utility – Distinction between Process Costing and Job Costing - Normal Loss – Abnormal Loss – Abnormal Gain – Process Accounts

UNIT – III: Process Costing, Joint and By Products

Equivalent Production – FIFO Method only - Inter Process Profit - Joint Products and By Products

UNIT – IV: Service Costing

Operating Costing in Service Industries – Meaning – Operating Cost Units – Transport Costing – Power House Costing – Hotel Industry Costing

UNIT –V: Standard Costing and Variance Analysis

Standard Costing and Variance Analysis: Standard Cost & Standard Costing – Meaning – Advantages and Disadvantages – Variance Analysis - Material Cost Variance – Labour Variance – Overheads Cost Variance.

Reference Books:

1. S.P Iyengar – Management Accounting, Sultan Chand & Sons, New Delhi.
2. S.P Jain and K.L Narang – Cost Accounting, Kalyani Publishers, New Delhi.
3. S.N.Maheshwari – Principles of Cost Accounting, Sultan Chand & Sons, New Delhi.
4. Dr. Reddy & Hari Prasad Reddy, Cost Accounting, Margham Publications, Chennai.
5. Dr. A. Murthy & Dr. S. Gurusamy, Cost Accounting, Vijay Nicole Publications, Chennai.

DIRECT TAXES
(Subject Code: P3CO4003)
(6 Hours)

UNIT – I: Introduction

Basic Concepts – Residential Status and Incidence of Tax – Income Exempt from Tax.

UNIT – II: Income from Salary and House Property

Computation of Income from Salary – Allowances – Perquisites – Valuation of Perquisites – Deductions – Income from House Property – Annual Value – Let out House – Self Occupied House – Deductions.

UNIT – III: Income from Business & Profession and Capital Gains

Profits and Gains of Business or Profession – Admissible Deductions – Expenses Expressly Disallowed – Deemed Incomes – Depreciation – Block of Assets – Normal Depreciation – Additional Depreciation – Capital Gains - Short term and Long term Capital Gains – Exemptions.

UNIT – IV: Income from Other Sources and Computation of Total Income

Income from Other Sources – Aggregation of Income – Set-off and Carry forward of Losses – Deductions available from Gross Total Income

UNIT – V: Assessment Procedure

Assessment Procedure – Methods - Assessment of Individuals – Assessment of Firms and AOP – Wealth Tax – Meaning of Assets – Deemed Assets – Exempted Assets – Computation of Net Wealth.

Reference Books:
1. Gaur and Narang, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
2. Vinod K Singhania and Monica Singhania, Students' Guide of Income Tax, Taxmann, New Delhi.
3. H.C. Mehrothra, Income Tax Law and Practice, Sahithya Bhavan, Agra.
4. Reddy TS and Hari Prasad Reddy Y, Income Tax Law & Practice, Margham Publications, Chennai.
5. Hariharan N, Income Tax Law & Practice, Vijay Nicole Imprints Pvt.Ltd., Chennai.

SECURITY ANALYSIS
(Subject Code: P3CO4004)
(6 Hours)

UNIT – I: Introduction

Investment – Types – Speculation – Gambling – Importance of Investments – Features of an Investment Program – Kinds of risks associated with an investment – Investment related terminology - Market Indexes – BSE Index (BSE 100, BSE 200, BSE 500, Mid cap, Small Cap & BSE Bankex) – CNX Indexes – Users and uses of Market Index.

UNIT – II: Security Analysis

Meaning and Scope of Security Analysis – Significance – Approaches to Security Analysis - Fundamental Security analysis – Types – Economic Analysis - Industry Analysis – Company Analysis.

UNIT – III: Technical Analysis

Technical Analysis – Technical vs. Fundamental Analysis – The Dow Theory – Elliot Wave Principles – Kondratev Wave Theory - Charting as a Technical Tool – Types of Charts – Limitations of charts. Efficient Market Theory – Forms of Efficient market Hypothesis – Random Walk Theory.

UNIT – IV: Valuation of Securities

Valuation of Securities – Equity Shares – Preference Shares – Debentures – Bonds – Dividends – Government Securities

UNIT – V: Portfolio Analysis

Portfolio Analysis – Portfolio Choice – Markowitz Portfolio Selection Model – Sharpe's Single Index Model – Capital Asset Pricing Model – Security Market Line – Capital Market Line – Estimating Beta – Beta Basics.

Reference Books:

1. V.K. Bhalla – Investment Management, S Chand & Co. Ltd., New Delhi.
2. R.P. Rustogi – Investment Analysis and Portfolio Management, Sultan Chand & Sons, New Delhi.
3. Dr. Ranganathan and Madhumathi R. – Investment Analysis and Portfolio Management, Pearson Education, New Delhi.
4. S.Kevin – Portfolio Management, Prentices Hall of India (Pvt. Ltd) New Delhi.
5. Dr. L. Natarajan, Investment Management, Margham Publications, Chennai.

EXPORT MANAGEMENT
(Subject Code: P3COE401)
(6 Hours)

UNIT-I: Introduction to Export & Export Management

Meaning of Export – Role of export in Economic Development - Planning for Export – Market Analysis – Market Intelligence and Market Research – Market Selection and Entry Strategies for Export – Export Management – Meaning – Need – Features – Process - Functions of an Export Manager

UNIT-II: Legal Aspects of Export Trade

Legal aspects of Export Trade: International Law – Transport Contracts – Settlement of Disputes – Indian Laws: Highlights of EXIM Policy

UNIT-III: Export Financing and Pricing

Methods and Sources of Export Finance – Terms of payment for Export – Letter of Credit - Institutional Aid for Export Financing: RBI, EXIM Bank and ECGC. Export Pricing: Factors influencing export price - Forms of pricing - International price quotations.

UNIT-IV: Export Procedures and Incentives

Stages in Export procedure: Export order execution – Product preparation – Quality Control and Pre-shipment inspection – Packaging – Freight Forwarders – Cargo Insurance – Customs Clearances – Documentation procedure and Clearing Export bills.

Export incentives available to Indian Exporters.

UNIT-V: India's Export Trade

Performance of India's Export Trade – Problems in Export Trade – Need for Export Promotion in India – Institutional Support for Export Promotion.

Reference Books:

1. TAS Balagopal, Export Management, Himalaya Publishing House, Mumbai.
2. Varshney & Battacharya, International Marketing, Sultan Chand & Sons, New Delhi.
3. B.S.Rathor, Export Management, Himalaya Publishing House, Mumbai.
4. Francis Cherunilam, Export Management, Himalaya Publishing House, Mumbai.
   D.C.Kapoor, Export Management, Vikas Publishing

CONDENSED MATTER PHYSICS – I

Paper Code: P3PY3001
Credits; 4
Hrs/week: 5

Objective: This paper aims to give an understanding of the basic theoretical models to study the properties of matter from a microscopic point of view

UNIT- I: Diffraction and Reciprocal lattice

Types of lattices- symmetry elements- Space Groups- Bravais Lattices- Simple crystal structure- Atomic packing Factor (SC, BCC, FCC,HCP) – Crystal diffraction – Bragg's law – Scattered Wave Amplitude – Reciprocal Lattice (SC, BCC, FCC) – diffraction Condition – Laue equation – Types of crystal bonding

UNIT- II: Lattice vibration and Phonons

Vibrations of crystal lattices –mono atomic and diatomic one dimensional lattice, phonon momentum – Inelastic scattering by phonons- Debye theory of specific heats, thermal expansion and thermal conductivity –Umkalapp Process

UNIT- III: Free electron theory of metals

Free electron in solids-Drude Lorentz free electron theory – Wiedemann-Franz law-Free electron gas in three dimension-fermi dirac distribution function - Density of states –Fermi surface, Fermi gas at T=0K, Specific heat capacity of electrons in metals.

UNIT- IV: Band theory of solids

Band structure of solids- Electron in periodic potentials-Bloch's theorem –Kroning-Penny model- Brillouin zones- Semiconductors-concept of hole and concept of effective mass- Intrinsic carrier concentration-Temperature dependence- Mobility-Impurity conductivity- Hall effect– Experimental method in Fermi surface studies-de Hass-van alphen effect

UNIT- V: Super conductivity

Superconductivity: Occurrence – Effect of magnetic fields-Meissner effect – Entropy and heat capacity- Energy gap – Type I and II superconductors.
Thermdynamics of super conducting transition – London equation – Coherance length – Cooper pairs – BCS Theory – Single particle tunneling- Josephson tunneling – DC and AC Josephson effect – flux quantization – SQUIDS – high temperature superconductors.

Books for Study
1. Solid State Physics- S.O.Pillai
2. Solid State Physics-K.Ilangovan
3. .Introduction to Solid State Physics- Charles Kittel
4 .Solid State Physics-Gupta kumar

BOOKS FOR REFERNCE:

1. **G.K. Narula, K.S.Narula** and **V.K.Gupta**, 1988, *Materials Science*, Tata McGraw-Hill.
2. **Lawrence H. Van Vlack**, 1998, *Elements of Materials Science and Engineering*, 6th Edition, second ISE reprint, Addison-Wesley
3. **H. Iabch and H.Luth**, 2001, *Solid state Physics – An introduction to principles of Material Science*, 2nd Edition, Springer
4. **S.L Kakani and Amit Kakani,** 2006, *Material Science*, New Age International Publishers

NUCLEAR AND PARTICLE PHYSICS

Paper Code: P3PY3002
Credits; 4
Hrs/week: 4

Objective: This paper aims to explore the understanding of the nuclear models and various physical properties of nucleus.

UNIT- I: Nuclear Forces

Central and non central forces- Meson theory of nuclear force- Yukawa potential- Spin dependence of nuclear forces-Charge independence of nuclear forces-Isospin formalism-Ground state of deuteron.

UNIT- II: Nuclear Models

Liquid drop model-Bohr Wheeler theory of nuclear fission-Shell model-Spin orbit coupling-Magic number-Application of shell model-Angular momentum-Magnetic moment-parity-Collective model of Bohr and Mottleson.

UNIT- III: Nuclear Reaction

Types of nuclear reactions-Conservation laws-Q value equation-scattering and partial wave analysis of cross section-Compound nucleus-Energy level of nuclei-level width and de-excitation- Reciprocity theorem-Briet Wigner dispersion formula.

UNIT- IV: Beta and Gamma Decays

Beta decay-Fermi theory of beta decay-Shape of the beta spectrum-Total decay rate-Mass of neutrino-Angular momentum and parity - selection rules - Non conservation of parity.
Gamma decay –Multi pole transition in nuclei-Angular momentum and parity - selection rules- Internal conversion-Pair production-Nuclear isomerism.

UNIT- V: Elementary Particle Physics

Classification of elementary particles- Types of interaction between elementary particle-Hadrons and Leptons-Symmetry and conservation laws –CPT Theorem-SU(2)-SU(3) multiplets- Quark model-Gell-Mann –Okubo mass formula for octet and decuplet of hadrons.

Books for Study
1 .Nuclear Physics-R.R.Roy and B.P.Nigam, Wily Eastern Ltd, New York
2. Nuclear Physics-D.C.Tayal, Himalya Publications, Bombay
3. .Nuclear Physics vol II- S.N.Ghosal ,S.chand & co New Delhi

Books for reference:
1. **H. A. Enge**, 1983, *Introduction to Nuclear Physics*, Addison-Wesley, Tokyo
2. **Y. R. Waghmare**, 1981, *Introductory Nuclear, Physics*, Oxford-IBH, New Delhi.
3. **Ghoshal**, *Atomic and Nuclear Physics*, Vol. 2
4. **J. M. Longo**, 1971, *Elementary particles*, McGraw-Hill, New York.

5. **R. D. Evans**, 1955, *Atomic Nucleus*, McGraw-Hill, New York.
6. **I. Kaplan**, 1989, *Nuclear Physics*, Narosa, New Delhi
7. **B. L. Cohen**, 1971, *Concepts of Nuclear Physics*, TMH, New Delhi

   WEB SITES
1. http://ocw.mit.edu/OcwWeb/Physics/8-701Spring 2004/Lecture notes
2. http://faraday.physics.utoronto.ca/General Interest/D.Bailey/SubAtomic/ Lectures/ Lect.html

MICROPROCESSOR AND ITS APPLICATIONS
Paper Code: P3PY3003
Credits; 4
Hrs/week: 5

Objective: The students are exposed to the wide applications of microprocessors like 8085, 8086
and so on., and interfacing them.

UNIT-I: 8085 Microprocessor
8085 Architecture and flags, pin out configurations of 8085 Bus organization and timings: buses – buffer – address bus, data bus, multiplexing address/data bus, timing diagrams- instructions cycle, machine cycle –flags- Interrupts of the 8085 Microprocessor – maskable and nomaskable interrupts.
8-bit code conversion: Binary to BCD, BCD to binary, binary to ASCII, ASCII to binary, BCD to ASCII and ASCII to BCD.

UNIT- II: Programming Model of 8085 and Interfacing
Classification of instructions and format – 8-bit data transfer, arithmetic, logical and branch instructions – Addressing modes- stack and subroutine instructions - Logical rotate and compare instructions – RIM and SIM interrupt instructions.
Memory interface: 2K X 8, 4K x 6 ROM and RAM interface - programmable peripheral interfacing device 8255 - interfacing 8-bit D/A and successive approximation A/D converters.

UNIT- III: 8086/8088 Microprocessor – Architecture and Programming

Introduction – Architecture – Pin configuration – Minimum mode and maximum-mode system — Internal Architecture of the 8086/8088.
INTERRUPTS OF THE 8086/8088 MICROPROCESSOR: Introduction – Types of interrupts – Interrupt Address Pointer Table – Interrupt instructions – Masking of interrupts – External hardware interrupt interface —— Software interrupt – Non-Maskable interrupt – Reset interrupt – Internal interrupt functions.

UNIT- IV: Programming – Software Model of the 8086/8088 and Interfacing

Instruction set – Data transfer instructions – arithmetic, logic, shift, rotate instructions – compare, jump instructions – Subroutines – handling instructions – loop and string instructions – Addressing modes - Procedures – Assembler Macros – Assembler Directives –MASEM Programs.

Minimum system mode interface – Maximum system mode interface -Interfacing 4K word/8K word/16K word RAM interface-Dynamic RAM.

UNIT- V: Advance Microprocessors

Introduction–Multitasking Concepts –Multiprogramming – Virtual memory, Memory Management Unit (MMU) –Introduction to Intel 80286, 80386 and 80486 microprocessors - Difference between 8086 and 80386/80486 microprocessors and also Introduction of Pentium processor.

Books for study
1. Ramesh Goanker: Microprocessor Architecture, Programming & Applications with the 8085/8080A – Wiley Eastern Ltd.
2. V.Vijayendran, Fundamentals of Microprocessor – 8086 Architecture, Programming and Interfacing,Chennai.
3. Douglas V. Hall: Microprocessors Interfacing, Programming & Hardware – Tata McGraw-Hill.
4. B.Brey – Intel Microprocessors: 8086/8088, 80186, 80286, 80386, 80486: Architecture, Programming and Interfacing, 3rd Ed, EEE, 1995.
5. Mohamed Rafiquizzman: Microprocessors and Microcomputer Based System Design UBS, 1990.

Books for reference
1. Glenn A. Gibson & Yu-Cheng Liu: Microcomputers for engineers and Scientists – Presentic-Hall Inc.
2. Dougles V. Hall: Microprocessors & Digital Systems –McGraw- Hill Book Company.
3. Stwart M.Asser: Microcomputer servicing – Practical systems and trouble shooting – All India Traveller Book Company.
4. Yu – Chang Liu & Glenn A. Gibson: Microcomputer systems: The 8086/8088 family Architecture programming & design – Printice-Hall of India.

ELECTIVE PAPER III
SYNTHESIS AND CHARACTERIZATION OF NANOMATERIALS
Paper Code: P3PY3004
Credits; 5
Hrs/week: 5

UNIT- I: Synthesis of nanomaterials

Fundamentals of sol-gel process – sol-gel synthetic methods for oxides – other inorganic and nano composites – Introduction – fundamentals of film deposition – molecular beam epitaxy – pulsed laser deposition – Metal Organic chemical vapour deposition.

UNIT- II: Synthesis of nanostructures

Surface Chemistry and its role to prepare quantum dots – Polymer as quantum dot size stabilizer – One-dimensional (1D) by Spontaneous Growth – Template Assisted Growth – Electrochemical growth of 1D structure- Types of nano tubes – formation of nano tubes.

UNIT- III: Structural Analysis

Working of Atomic Force Microscopy – Mode of operations (qualitative) and its application – Basics of X-Ray diffraction, STM and its application to Size Analysis of nano materials – NMR Basics and application to nano materials

UNIT- IV: Characterization

SEM and TEM: Theory- Instrumental setup and its application- working of electron probe micro analysis and its application in elemental analysis – EDX spectra for important material systems.

UNIT- V: Optical studies

Optical properties of nano semiconductors – optical process in quantum wells – semiconducting optoelectronic devices – organic optoelectronic devices (qualitative) – Determination of band gaps from UV-vis and PL studies.

References:
1. Nanotechnology: basic science and emerging technologies – Mick Wilson,Kamali Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse, Overseas Press (2005)
2. Amorphous and Nanocrystalline Materials: Preparation, Properties, and Applications,
    A.Inoue, K.Hashimoto (Eds.,) (2000)
3. Introduction to Nanotechnology, Charles P. Poole, Frank J. Owens, Wiley-Interscience (2003)

4. Fundamentals of Surface and Thin Film Analysis, Leonard C.Feldman and James W. Mayer

5. Nanoelectronics and Information technology: Advanced electronic materials and novel
   devices (2nd edition), Rainer Waser (Ed.), Wiley – VCH Verlag, Weiheim (2005)

6. Nanocomposite science and technology, Pulickel M. Ajayan, Linda S. Schadler, Paul V.
   Braun, Wiley – VCH Verag, Weiheim (2003)

7. Amorphous and Nanocrystalline Materials: Preparation, Properties, and Applications,
   A.Inoue, K.Hashimoto (Eds.,) (2000)

8. Quantum Heterostructures: Microelectronics and Optoelectronics, Vladimir Mitin

9. Theory of Modern electronic semiconductor devices, K.F. Brennan and A.S. Brown

10. Semiconductor Nanostructures for Optoelectronic applications, Todd D. Steiner

11. Optical properties and Spectroscopy of nanomaterials – Jin Zhong Zhang, World Scientific
    (2009).

12. Core concept of nanotechnology with application spectrum – Rakesh Rathi, SBS
    Publishers (2007).

CORE PRACTICAL III
GENERAL EXPERIMENTS
(Any 10 out of the given 15)

Credits; 4
Hrs/week: 6

1. GM counter – Characteristics, inverse square law.
2. G.M. Counter - absorption coefficient.
3. Michelson Interferometer – Wavelength, separation of wavelengths
4. Michelson Interferometer - thickness of mica sheet.
5. F.P.Etalon – using Michelson set up.
6. Hall effect.
7. Molecular spectra – ALO band.
8. Molecular spectra – CN Band.
9. Susceptibility by Quincke's method.
10. Susceptibility by Guoy's method.
11. Ultrasonic Interferometer – Velocity and Compressibility of a liquid.
12. Ultrasonic Diffraction - Velocity and Compressibility of a liquid.
13. Dielectric measurements in Microwave test bench.
14. B-H curve using CRO.
15. Spectral analysis of a salt.

NON MAJOR

BIO-MEDICAL INSTRUMENTATION

Credits; 4
Hrs/week: 5

Objective: This paper aims at introducing the learner to understand the various Instruments   used in medical field to analyses the data.

UNIT- I: Transducers and Sensors

Classification of Transducers - Principle, construction and working of Thermisters, LVDT, Electrical strain gauges and capacitive transducers – Optical fibre sensors – Photometric sensors – Physical sensors – Chemical sensors – Biosensors – Sources of biomedical signals

UNIT- II: Digital Instrumentation

Principle, block diagram and working of Digital frequency counter, digital multimeter digital pH meter, digital conductivity meter and digital storage oscilloscope

UNIT- III: Analytical Instrumentation

Principle, block diagram, description, working and applications of UV- VIS spectrometer, FT-IR Spectrometer – AES spectrometer – Basic concepts of Gas and Liquid Chromatography.

UNIT- IV: Bio – Medical Instrumentation

Sources of biomedical signals – Physiological transducers to measure blood pressure, body temperature - Sources of Bio – electric potentials - resting potential, action potential, bio potentials electrodes - Principle, block diagram and operation of ECG and EEG Recorders.

UNIT- V: X-ray machine and Digital Radiography

Basis of Diagnostic Radiology – Block diagram and operation of X-ray machine – X-ray film – fluorescent Screen – X-ray image Intensifier television System – Digital X-ray imaging system – Basic principle and operation of X-ray computed tomography

Books for Study
1. Dr. Rajendra Prasad, Electronic Measurements and Instrumentation, Khanna Publications.
2. S. Ramambhadran, Electronic Measurements and Instrumentation Khanna Publications.
3. R S Khandpur, Hand book of Biomedical Instrumentation II [nd] Edition, Tata Mc Graw-Hill Publishing Company Limited, New Delhi
4. Bio medical Instrumentation by Arumugam.

Books for Reference
1. S.M .Dhir , Electronics and Instrumentation, Khanna Publisher,
2. Saifullah Khalid, Mukesh Jain, Neetu Agrawal, Basic Electronics and Instrumentation,University Science Press,Laxmi publications, New Delhi.

CRYSTAL PHYSICS AND CRYSTALLOGRAPHY

Credits; 3
Hrs/week: 5

Objective: This paper aims to give an understanding of the Crystal Structure, Properties and Refinement Techniques.

UNIT- I: Symmetry and lattices

Crystal-Crystal lattice-Primitive cell –Non primitive cell – Cubic structure and packing factor for sc, fcc, bcc, hcp, and diamond structure – Miller indices –determination – symmetry element- operation – space group – plane group – equivalent position – reciprocal lattice –construction – reciprocal of bravais lattice.

UNIT- II: X-ray Diffraction

X-ray – generation – Ewald`s sphere – X- ray diffractometer – four circle diffractometer – X-ray detector – image plate - data collection – X- ray diffraction of crystal lattice – Coherent scattering of X-ray by electron – Scattering by one atom - diffraction from a one dimension crystal – Laue formulae of X- ray diffraction.

UNIT- III: X-ray Diffraction Methods

Laue diffraction – orientation – calculating Laue angles –method – rotating crystal method – X- ray powder diffraction- principle- methods of powder diffraction pattern – interpretation of powder photographs – applications and limitation of X- ray powder diffraction

UNIT- IV: Determination of Crystal Structure

Scattering factor –structure factor- determination of structure factor –amplitude from intensities- data reduction – crystallization – crystal mounting – collection of Bragg's intensities – phase problem – need for phase – Patterson method –heavy atom technique – anomalous dispersion – direct method procedure –Fourier map.

UNIT- V: Refinement of Crystal Structure

Weighting scheme – residual indices – least square refinement – thermal parameters – Wilsons plot – space group determination – structure refinement - structural analysis – bond length - bon d angle - torsion angle - confirmation of rings

Book for study:
1. D. Velmurugan , Elementary Crystallography ,MJP publisher, Chennai
Books For Reference:

1. **N. W. Aschroft** and **N. D. Mermin**, *Solid State Physics,* Rhinehart and Winton, New York.
2. **A. J. Dekker**, *Solid State Physics*, Macmillan India, New Delhi.
3. **S. O. Pillai**, 1997, *Solid State Physics*, New Age International, New Delhi.

4. **S. O. Pillai**, 1994, *Problems and Solutions in Solid State Physics,* New Age International, New Delhi.
5. **J. P. Srivastava,** 2001, *Elements of Solid State Physics,* Prentice-Hall of India, New Delhi.
6. **A.Wahab,** 2009, *Solid State Physics*, Narosa Publishing House, New Delhi.
7. **Saxena, Gupta, Saxena**, 2003, *Solid State Physics*, Pragati Prakashan, Meerut.

CONDENSED MATTER PHYSICS – II

Credits; 3
Hrs/week: 5

Objective: This paper aims to give an understanding of the advance theoretical models to study
the properties of matter from a microscopic point of view.

UNIT- I: Dielctrics

Dielectric solids- Different types of polarization, frequency and temperature effects on polarization-Dielectric loss and Dielectric Breakdown - Local or internal field-Clausius Mosotti equation-determination of dielectric constant- Classification and applications of dielectric materials – piezoelectric and ferroelectric materials.

UNIT- II: Magnetism I:

Definitions of Magnetism-Classification – Langevian theory of Dia magnetism(classical theory)-Quantum theory of Dia Magnetism-classical theory of paramagnetism - Quantum theory of paramagnetism- Rare earth ion - Quenching of orbital angular momentum – Adiabatic demagnetization

UNIT- III: Magnetism II:

Quantum theory of ferromagnetism – Curie point- Heisenberg's interpretation of Weiss field – Ferromagnetic spin waves- Quantization of spin wave-Thermal excitation of magnons- Ferromagnetic domain-Origin of domains– Bloch wall (Domain wall energy)-Theory of antiferomagnetism – Neel temperature- Susceptibility below Neel temperature-

UNIT- IV: Optical Properties

Optical reflectance - Kramers- kronig relation-Electronic interband transitions-Drude relation for optical conductivity – optical absorption in metals, insulator and semiconductor - Excitons -Frenkel and Mott-Wannier Excitons – luminescence-photoluminescence- electroluminescence.

UNIT- V: Surface Physics

Surface structure-simple super lattice-Incoherent Lattice- low energy electron diffraction-Lattice dynamics at surfaces- Surface Polarization-Localized modes-surface electronic states-Richardson-Dushman equation

Books for Study

1. Solid State Physics- S.O.Pillai
2. Solid State Physics-K.Ilangovan
3. .Introduction to Solid State Physics- Charles Kittel
4 .Solid State Physics-Gupta kumar

BOOKS FOR REFERENCE:

1. **N. W. Aschroft** and **N. D. Mermin**, *Solid State Physics,* Rhinehart and Winton, New York.
2. **A. J. Dekker**, *Solid State Physics*, Macmillan India, New Delhi.
3. **S. O. Pillai**, 1997, *Solid State Physics*, New Age International, New Delhi.
4. **S. O. Pillai**, 1994, *Problems and Solutions in Solid State Physics,* New Age International, New Delhi.
5. **J. P. Srivastava,** 2001, *Elements of Solid State Physics,* Prentice-Hall of India, New Delhi.
6. **A.Wahab,** 2009, *Solid State Physics*, Narosa Publishing House, New Delhi.
7. **Saxena, Gupta, Saxena**, 2003, *Solid State Physics*, Pragati Prakashan, Meerut.

ELECTIVE PAPER - IV

EMBEDDED SYSTEM

Credits; 5
Hrs/week: 5

Objective: This paper aims at introducing the learner to the very popular Intel 8051, the PIC24
       family and the widely used ARM embedded processor

UNIT- I: 8051 Architecture and Microcontroller

Microprocessor Vs Microcontroller – Types of Microcontroller - 8051 Architecture – 8051 Microcontroller hardware - input/output pins – Memory Organization – Ports & Circuits – Counters – Timers – Serial data input/output – Interrupts, Operand types and Operand addressing.

UNIT- II: 8051 Family Microcontrollers Instruction Set

Addressing modes – Data transfer instructions Data and Bit manipulation instructions – arithmetic instructions – Instruction for logical operations, Internal RAM, and SFRs – program flow control instructions – Interrupt control flow

UNIT- III: 8051 Interfacing and Applications

Interfacing external memory – Keyboard and display devices – LED -7-segment LED display – 2- phase 6-wire stepper motor – interfacing Programmable Peripheral Interface (PPI) device 8255 – Interfacing analog to digital converter 0801 with 8051.

UNIT- IV: PIC18/24 Architecture

Architecture – memory organization – addressing modes – instruction set –PIC programming in Assembly & C – input/output port, data conversion, RAM &ROM allocation timer programming, MP – LAB

UNIT-V: ARM Architecture

Arm architecture – ARM core signal description – ARM core families – Registers - Pipeline – Thumb instruction set – ARM instruction set – internal memories - Peripherals

Book for Study:
1. Programming and customizing the 8051 microcontroller by Michael Predko, McGraw – Hill (1999)
2. PIC microcontroller and embedded system: using assembly and C for PIC18 by Muhammad Ali Mazidi, Rolin D, McKinlay, Danny Pearson Prentice Hall (2008)
3. Real Time Embedded System, Cranes Software International Ltd. Bangalore
4. Introduction to Embedded systems Shibu K V , Tata McGraw Hill, New Delhi

Book for References:

1. Embedded System by Raj Kamal, TMH, 2006
2. The 8051 Microcontroller By K Ayala 3rd Ed., Thomson Delmer Learning 2007
3. PIC Microcontroller by H.W Huang, Delmar CENGAGE Learning, 2007

CORE PRACTICAL IV
MICROPROCESSOR EXPERIMENTS &
COMPUTER PROGRAMMING (C Programme)

(Any 15 out of the given 20)

Credits; 4
Hrs/week: 6

MICROPROCESSOR
1. Number conversion - 8 bit and 16 bit: BCD to binary, Binary to BCD, Hex to ASCII using 8085.
2. Square and square root of BCD and HEX numbers 8 bit and 16 bit using 8085.
3. Addition and substraction using 8086.
4. Multiplication and division using 8086.
5. Sum of a simple series.
6. Time delay subroutine and a clock programme.
7. Double and Triple precision addition and subtraction using 8085/8086.
8. Switching an array of LED's by programming.
9. Op-Amp 8-bit DAC.
10. ADC interfacing 0809 with MPU.
11. Interfacing and programming 0800 with MPU.
12. Analog to digital conversion using DAC comparator and MPU system.
13. Wave form generation – Asymmetrical square wave and ramp.
14. Interfacing a stepper motor to the MPU system – clockwise and anticlockwise – full stepping and half stepping.
15. Ascending order / descending order using 8085.

COMPUTER PROGRAMMING (C Programme)
16. Newton's interpolation with algorithm, flowchart and output.
17. Lagrange's interpolation with algorithm, flow chart and output.
18. Numerical integration by Trapezoidal / Simpson's rule with algorithm, flow chart and output.
19. Solution of a polynomial equation and determination of roots by Newton Raphson method with algorithm, flow chart and output.
20. Curve fitting – Least square fitting with algorithm, flow chart and output.

PROJECT

Course Work

Credits; 3
Hrs/week: 4

1. Projects would be allotted to III Semester students which have to be carried out and completed
   in Semester IV.

2. A list of projects will be finalized and announced by the Department. The students will   have
   an option to select the project in their field of interest.

4. The project will comprise of the following:

   a.   Study of background material
   b. Collection of data, procurement and fabrication of experimental set up and writing of computer programs if needed.

   b.   Giving a preliminary seminar in the III semester for the purpose of internal assessment.
   d. Writing a dissertation or project report. This will be submitted by the students at the end of IV semester.

   Reserch methodology theory paper -75 marks

PROJECT

Viva-Voce

The Final evaluation of the project work completed will be done by external and internal examiners appointed by the Board on the basis of an oral presentation and the submitted Project-Report.

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SEMESTER- III
PAPER – XI MOLECULAR ENDOCRINOLOGY

</div>

Paper Code: **Hrs: 5 Hrs/Week**
Credits: 4   **Total Hours: 75 hrs**

Objectives: To understand endocrine function, biological actions of hormones, their synthesis,

           secretion, regulation and their related pathological conditions.

UNIT – I CLASSIFICATION AND MECHANISM   **15 hrs**

Hormones – definition, classification based on receptors, signal transduction and second messengers – adenylate cyclase system, cAMP. G-protein as cellular transducer, inositol triphosphate and calcium release. Glycogen phosphorylase kinase, DAG and protein kinase C pathway, Atrial natriuretic factor, protein kinase cascade. Hormone receptor's interaction.

UNIT – II HORMONES RECEPTORS AND REGULATION   **15 hrs**

Steroid hormone receptors, intracellular protein receptors, structural organization of receptor protein, hormone binding domain, antigenic domain and DNA binding domain, organization of functional elements – hormone response elements. Structure of insulin receptor, internalization of receptors.

UNIT – III PITUITARY AND HYPOTHALAMIC HORMONES   **15 hrs**

Hormonal cascade system involving Hypothalamus. Structure, physiologic and biochemical actions of polypeptide hormones – growth hormone, prolactin and chorionic somatomammotropin. Glycoprotein hormones and POMC peptides – ACTH, LPH, MSH and Endorphins. Vasopressin and Oxytocin.

UNIT – IV THYROID, PARATHYROID AND PANCREATIC HORMONES   **15 hrs**

Structure, synthesis, biochemical and physiologic actions of thyroxine, Pathophysiology – Hypo and hyperthyroidism. Structure, synthesis, biochemical and Physiologic actions of parathyroid hormone, pathophysiology – Hypo and hyper parathyroidism. Regulation of synthesis and secretion of thyroxine and PTH.
Structure, synthesis and biological role of insulin, glucagon and somatostatin. Adrenal medulary hormones, Adrenal cortex hormones, Epinephrine and Nor-epinephrine.

UNIT – V STEROID HORMONES   **15 hrs**

Structure, biosynthesis, transport of steroid hormones in blood and metabolic inactivation of steroid hormones, control of synthesis and release of steroid hormones, steroid receptors. cortisol, aldosterone, testosterone, estrogens, progesterone and calcitriol, ovarian cycle and role of hormones.

TEXT BOOKS:
1. Text book of Endocrinology by Wilson and Foster, W.B. Saunders Co.
2. Review of Medical Physiology by William.F. Ganong. McGraw-Hill 2005

3. Human Physiology and Mechanisms of Disease by Guyton. Saunders 6th edition 1996

REFERENCES:

1. Essential Endocrinology – Charles G.D Brook – New Age International – 4th edition.
2. Endocrinology – Hormones and Human health – Prakash S. Lohar – MJB publications.
3. Endocrinology basic and Clinical Principles – Shlomo Melmed P. Michael conn Humana press – 2nd edition.
4. Molecular Endocrinology – Franklin F. Bolander – Academic publishers – 3rd edition.
5. Basic medical endocrinology – Good man – Academic publishers – 3rd edition.
6. Text book of Biochemistry (with clinical correlation) by Devlin, Wiley 6th edition (2005).
7. Harper's Biochemistry by R.K.Murray *et al*., Mc Graw – Hill Medical, 27th edition (2006).

PAPER-XII; MOLECULAR BIOLOGY

Paper Code: **Hrs: 5 Hrs/Week**

   Credits: 4   **Total Hours: 75 hrs**

OBJECTIVES :
   ✓ To understand the basis of molecular biology
   ✓ To understand the genetic mutation and repair processes
   ✓ To understand the current trends in molecular and genetic research

UNIT – I DNA REPLICATION   15 hrs

Prokaryotic and Eukaryotic replication – experimentalevidence for semiconservative replication –Messelson and Stahl experiment, replications in circular chromosomes.Inhibitors of replication, replication bubble, bidirectional replication, replicon, action of SSB, Primer, primase, Primosome, DNA gyrase, DNA helicases, DNA ligase, Topoisomerase, DNA polymerase (Prokaryotic and Eukaryotic), lagging and leading strand synthesis, endonucleases, exonucleases, telomerase, retroviral replication, temporal control of replication.

UNIT – II TRANSCRIPTION
                                                                        15 hrs

Transcription – definition, structure of RNAs, prokaryotic and eukaryotic transcriptionRNA polymerase,promoter, enhancers, repressors, regulatory elements, initiation, elongation, termination, inhibitors of transcription. Post transcriptional modification - RNA splicing.

UNIT – III GENETIC CODE AND TRANSLATION

15 hrs

Genetic code – definition, deciphering of the genetic code, codon,anticodan, salient features of genetic code.Activation and attachment ofamino acids to tRNA, A, P, and E sites of ribosomes, Wobble mechanism and its significance, Shine –Dalgarno sequence, prokaryotic and eukaryotic protein biosynthesis – initiation, elongation,termination, regulation, post-translational modification in prokaryotes and eukaryotes, role of endoplasmic reticulum, role of signal peptide, signal hypothesis, chaperons, inhibitors of protein synthesis.

UNIT – IV PROTEIN TRANSPORT AND GENE EXPRESSION   15 hrs

Protein targeting, translocation, heat shock proteins, glycosylation, SNAPs and SNAREs, bacterial signal sequences, mitochondrial, chloroplast and nuclear protein transport, endocytosis-viral entry, ubiquitin TAG protein destruction.

Gene expression and regulations, molecular mechanism of regulation, prokaryotes-operon model, lac, trpoperons, repression and attenuation, eukaryotes – C value paradox, repetitive DNA, gene dosage and gene amplifications.

UNIT – V MUTAGENESIS, DNA DAMAGE AND REPAIR

1 5 hrs

Mutagenesis and replication fidelity, numerical mutations involving full chromosomes set-causes, structural chromosome mutations-balanced and unbalanced –causes, karyotype mixing, misincorporation of nucleotides during DNA synthesis, transient and spontaneous chemical changes in DNA, frame shift mutagenesis, DNA damage-different types, DNA repair – direct reversal repair, direct repair of nicks, excision repair, nucleotide excision repair, mismatch repair, long and short patch mismatch repair, recombination error, SOS response and mutagenic repair.

TEXT BOOKS
1. Instant notes in molecular Biology 2nd edition – P.C. Turner, A.G. Mclennan.
2. Principle of Biochemistry and molecular biology – Wilson and walker
3. Molecular biology by David Friedfilter
4. Cell Biology, Genetics, Molecular Biology: Evolution and Ecology - P.S. Verma
5. Cell and Molecular Biology   P.K.Gupta

REFERENCES
1. Molecular biology by Robert F.WeaverMcGraw – Hill 4 edition (2007)
2. Genes VII by B.Lewin Oxford University Press, Cell Press, London (2000)
3. Cell and Molecular Biology by G.Karp, John Wiley and Sons Inc (2002)
4. Molecular Biology of genes 5th edition JamesWatson, Tania A. Baker – Pearson publication.
5. Darnell - Molecular Cell Biology 5th Edition
6. Lewin,sGene VIII, IX, X, XI – Kerbs, Goldstein, kilpatrick
7. Principles of genetics - symmons
8. Principles of Biochemistry by Leninger and Cox

PAPER XIII
PRACTICAL V-CHEMICAL ANALYSIS OF BLOOD

Paper Code: **Hrs:**
5Hrs/Week
Credits: 3   **Total**
Practical :15

1. Estimation of blood glucose by GOD-POD method
2. Estimation of serum proteins by Bradford's method
3. Estimation of plasma fibrinogen
4. Estimation of A:G ratio in serum
5. Estimation of Lipid peroxidation
6. Estimation of SOD
7. Estimation of Catalase
8. Estimation of Vitamin E and Vitamin C
9. Estimation of serum triglycerides
10. Estimation of serum cholesterol by Zlatkis, Zak and Boyle method
11. Estimation of serum phospholipids
12. Estimation of serum calcium
13. Estimation of serum bilirubin by Jendrassik and Crof method
14. Estimation of glycosylated hemoglobin
15. Estimation of blood constituents using auto analyzer

REFERENCE BOOKS:

6. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.

7. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.

8. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.

9. Experimental procedures n Life Sciences by Dr.S.Rajan & Mrs.R.Selvi Christy. Anjaana Book House.

PAPER - XIV
PRACTICAL- VI - CHEMICAL AND MICROSCOPIC ANALYSIS OF URINE

Paper Code: **Hrs:**
5Hrs/Week
Credits: 3   **Total**
Practical: 15

1. Qualitative analysis of urine for normal and abnormal constituents
2. Microscopic analysis of urine
3. Estimation of titrable acidity of urine
4. Estimation of true acidity
5. Estimation of protein in urine by Biuret method
6. Analysis of urinary calculi
7. Estimation of albumin in urine
8. Antibiotic sensitivity test in urine
9. Analysis of urine using urine analyzer
10. Urea clearance test
11. Creatinine clearance test

REFERENCES:

6. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
7. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
8. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
9. Experimental procedures n Life Sciences by Dr.S.Rajan & Mrs.R.Selvi Christy. Anjaana Book House.
10. Text book of Clinical chemistry –Teitz.
11. Medical Laboratory Science, Theory and Practice J. Ochei & A. Kolhatkar, Tata Mc Graw - Hill.

ELECTIVE – III
IMMUNOLOGY AND IMMUNO TECHNOLOGY

Paper Code: **Hrs:**   **5 Hrs/Week**

Credits: 4   **Total Hours:**   **75hrs**

Objectives:
- ✓ To know the basic concepts of the immune system.
- ✓ To understand the mechanism of immune action.

UNIT I: CLASSIFICATION and COMPONENTS OF IMMUNOLOGY
15 hrs
History and scope of immunology.Organs of the immune system- primary and secondary lymphoid organs – structure, maturation and functions.Infection, inflammation – types –mode of transmission, Immunity – types- mechanisms. Haematopoiesis

UNIT II: ANTIGENS AND ANTIBODIES
15 hrs
Antigen –structure and types. Immunoglobulin- structure, types and its function.Immunoglobulingene organization. Immune responses- humoral and cell mediated immune response (Immuno genicity)

UNIT III- ANTIGEN – ANTIBODY INTERACTIONS
15 hrs
Antigen – Antibody reactions. Complements- components, properties, activation and its path ways. Cytokines – properties and functions. Major histocompatibility complex – general organization and inheritance of MHC, structure – function- role in antigen processing and presentation.Immunological tolerance.

UNIT IV- IMMUNO PATHOLOGY
15 hrs
Hypersensitivity – types, mechanisms, manifestations. Transplantation – classification, transplantation antigens, graft acceptance, rejection, process of graft rejection, immuno suppressive therapy. Autoimmunity– Aetiology, types and its treatment. Tumor immunology, immune response to tumour, immuno theraphy.

UNIT V: IMMUNO TECHNOLOGY
15 hrs
Hybridoma technology, isolation of antigen and antibody, isolation of immune cells, detection of molecular markers, primary and secondary antibody, FACS, IHC, IF, IE.

TEXT BOOKS
1. RajasekaraPandian M and Senthilkumar B (2007) *Immunology and Immunotechnology*.Panima Publishing Corporation , New Delhi.
2. Kuby J (1997) *Immunology* 3rd Edn .WH Freeman andCo. New York.
References:
1.Goldsby RA, KindtTJ.Osborne BA, Kuby J (2003) *Immunology* 6th Edn. WH Freeman andCo. New York.
2. Benjamini E, Coico R and Sunshine G (2000). *Immunology* .4th Edn.A John Wiley and sons, Inc. Publication.

3. RoittI,Brostoff J and Male D (1993). *Immunology* 3rd Edn. Mosby.
4. Weir DM (1979). *Handbook of Experimental Immunology*.Black Well Scientific Publications. Oxford.
5. Pelczar MJ, Chan ECS and Krieg NR.*Microbiology* (2006) 5th Edn. Tata McGraw-Hill Publishing Company Ltd.New Delhi.
6. Tizard IR (1995).*Immunology* 4th Edn. Saunders College Publishing Harcourt Brace College Publishers.
7. Talwar GP and Guptha (2004).*A hand book of practical immunology* .2nd Edn.Vol II .CBS Publications.
8. A text of immunology and immunotechnology by B. Annadurai, S. Chand publications
9. Immunology by I. Kannan,
10. P. M. Lydyard, A. Whelan- Instant notes in Immunology, Viva Books Pvt. Ltd.

PAPER XVII -
ANIMAL CELL SCIENCE AND TECHNOLOGY

Paper Code: **Hrs: 5 Hrs/Week**
Credits: 4   **Total hours: 75 hrs**

Objectives:
 ✓ To understand the basics of animal cell culture and maintenance

UNIT I ANIMAL CELL   15 Hrs

Structure and organization of animal cell, cell physiology.Equipments and materials for animal cell culture technology. Aseptic Technique for cell cultures.Cryopreservation.

UNIT II STERILIZATION AND PREPARATION OF MEDIA   15 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 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 IV MAMMALIAN CELL CULTURE   15 Hrs

Basic techniques of mammalian cell culture in vitro; disaggregation of tissue and primary culture; maintenance of cell culture; cell separation. Scaling – up of animal

cell culture, Cell synchronization. Cell cloning, micromanipulation and types of cloning.Cell transformation.Application of animal cell culture.

UNIT V STEM CELL CULTURE   15 Hrs

Stem cell culture, embryonic stem cells and their applications. Cell culture based vaccines. Somatic cell genetics.Organ and histotypic cultures.Measurement of cell death.Apoptosis.Three dimensional culture and tissue engineering.

TEXT BOOKS:
1. Animal Cell Culture Techniques. Ed. Martin Clynes, Springer.
2. Animal Biotechnology, M. M. Ranga, III Revised edition, Agrobios (India), Jodhpur.

REFERENCES:
1. Culture of Animal cells, 3rd Edition, R. Ian Freshney. A John Wiley & Sons, Inc.,
   publications.
2. Animal Cell Culture- Practical Approach, R.W. Masters, Oxford.
3. Animal Cell Biotechnology, Methods and protocols, Nigel Jenkins, Humana Press.
4. Biotechnology of Animal Tissue. P.R.Yadav& Rajiv Tyagi. 2006. Discovery Publishing House. New Delhi.
5. Animal Cell Culture- Practical Approach. John, R.W.Masters. 2000. 3rd Edi.

NON MAJOR - NANOBIOCHEMISTRY

Paper Code: **Hrs: 5Hrs/Week**

Credits: 4   **Total**

Hours: **75 hrs**

OBJECTIVES:
- ✓ To study the therapeutic applications of nanomedicine.
- ✓ To know the social implications of nanotechnology.

UNIT-I: BASIC CONCEPTS OF NANO-BIOLOGY   15 hrs

Nano-definitions, biosystems, biological networks, biological neurons, neurotransmitters. Protein interactions modulated by chemical energy:- actin, myosin and molecular motors. Bionanoparticles – nanocomposites.

UNIT II: BIOMATERIALS SCIENCE   15 hrs

Introduction - Types of biomaterials. Biodegradable polymers.Biodegradation of solid polymers.Modes of erosion (surface & bulk). Synthesis of nanoparticle (top down, bottom up and green synthesis) Molecular effects on hydrolytic breakdown.

UNIT III: CHARACTERIZATION OF NANOSTRUCTURES   15 hrs

Techniques to construct nanostructures –scanning probe instruments, nanoscale lithographyUV spectrophotometry. Techniques to predict nanostructures –TEM, SEM, AFM.Characterization techniques – NMR, Mass (MALDI-TOF) spectroscopy, X-ray diffraction.

UNIT IV: NANO-BIOSENSORS   15 hrs

Biomedical sensors and biosensors-. Biosensors – definition and classification – potential based sensors; electrochemical sensors; acoustic/mechanical sensors; thermal and phase transition sensors; sensors in modern medicine- Biomembrane based sensors. Diagnostic imaging techniques (digital imaging; molecular imaging).

UNIT V: PROSPECTS OF NANOMEDICINE AND NOVEL DRUG DELIVERY SYSTEMS

Drug delivery systems – polymer therapeutics:- polymer drug conjugates; polymeric micelles; liposomes. Mechanical testing; elasticity; toughness; effect of fabrication on strength. Application of nano materials in medicine: cardiovascular medical devices; tissue regeneration (tissue engineering). Dendrimers as nanoparticulate drug carriers.

                                                    15 hrs

TEXT BOOKS:
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.

REFERENCES:
1. Molecular Design and Synthesis of Biomaterials Biological Engineering Division, MIT Open Course Ware, 27th May 2005.
2. Biomaterials Sciences: An Introduction to Materials in Medicine 2nd Edition, Buddy D.Ratner, Allan S. Hoffman, Frederick J. Schoen and Jack E. Lemons

3. Nanotechnology: A General Introduction to the Next Big Idea Mark Ratner and Daniel Ratner. Pearson Education Publishers, 2002.
4. Encyclopedia of Nanoscience& Nanotechnology,H.S. Nalwa (Ed.,),American Scientific Publishers, California, 2004.
6. Nano biotechnology: concepts, applications and perspectives.ChristoferM.Niemayer,ChadA.Mirkin ,Wiley VCH publishers 2004.
7. Bionanotechnology: Lessons from Nature,David .S.Goodsell,Jhonwiley 2006.
8. Nano-biotechnology, SubbiahBalaji, M. J. Publishers (2010).
9. Nano-biotechnology Concepts, Application & Perspectives, Edited By C. M. Niemeyer, C. A. Mirkin, Wiley-VCH India Pvt. Ltd.

SEMESTER - IV
PAPER XV - BIOTECHNOLOGY

Paper Code: **Hrs: 5Hrs/Week**
Credits: 5   **Total**
Hours: **75 hrs**
Objectives
- ✓ To apply the genetic concepts into manipulating living things.
- ✓ To exploit living things for human benefit.

Unit – IGENETIC ENGINEERING

15 hrs

Steps involved in gene cloning–tools -Restriction endo nucleases, DNA ligase, Cloning vectors - Plasmid PBR^{322}, PUC18/19, Phage - Phage λ, M13, Cosmid, high capacity cloning vectors - Yeast artificial chromosome vector, construction of genomic and cDNA library, Shuttle vector and Expression vectors.

Unit – II METHODS IN rDNA TECHNOLOGY

15 hrs

Construction of rDNA, linkers and adapters.Methods of gene transfer – transformation, transfection, transduction, electroporation, micro injection, Biolistics, Episome fusion. Method for screening of recombinant organisms.

Unit – IIITECHNIQUES OF GENETIC ENGINEERING

15 hrs

Agarose electrophoresis, SDS PAGE, Southern, Northern and Western blotting techniques, Autoradiography, DNA sequencing – Maxam-Gilbert's and Sanger dideoxy method.RNA sequencing. Mutagenesis - site directed mutagenesis, PCR, types and its applications. DNA chips and micro arrays – Applications.

Unit – IVPLANT AND ANIMAL BIOTECHNOLOGY

15 hrs

Production of transgenic plants and its applications -virus resistance, pest resistance, stress resistance, disease resistant plant, delayed fruit ripening. Production of transgenic animals and its applications -transgenic sheep, fish, cattle.

Unit – V GENETIC ENGINEERING FOR HUMAN WELFARE

15 hrs

Genetic engineering for human welfare – production of insulin, somatotropin, somatostatin, endorphin, human interferon, DNA vaccine, Hepatitis Vaccine, Tissue plasminogen activator (TPA), plantibodies, nutraceuticals. Gene therapy - the principle and approaches.

Industrial biotechnology – fermentation, principle, types product recovery and purification of ethanol, citric acid, vitamin B12, streptomycin.

TEXT BOOKS
1. Biotechnology – U. Satyanarayanan
2. A text book of Biotechnology – R.C. Dubey – S. Chand publications

BOOKS RECOMMENDED:
1. Primrose, S.B (1994) Molecular biotechnology (2nd Edi). Blackwell Scientific Publishers,
2. Benjamin Lewin. Genes-VIII. Oxford University Press.
3. Concept in biotechnology - D. Balasubraniam et al., Universal press India 1996.
4. Plant tissue culture - Razdan, Oxford IBH Publisher.
5. Animal cell culture – Freshney, IRL Press.
6. Animal Biotechnology – 2005. A.K. Srivastava, R.K. Singh and M.P. Yadav Oxford and IBH.
7. Molecular biotechnology 2006 – Channarayappa Univ. Press
8. Molecular Biology and Biotechnology - H.D. Kumar(1997), Vivas publishing house Pvt .Ltd
9. Molecular biotechnology – principle and application of recombinant DNA 3rd edition
10. Biotechnology – Prakash, S. Lohar, MJP publisher, Chennai -5.
11. Biotechnology – Glick and Pastunack

PAPER – XVI ADVANCED CLINICAL BIOCHEMISTRY

Paper Code: **Hrs: 5Hrs/Week**

Credits: 5   **Total Hours: 75 hrs**

Objectives:

- ✓ To understand the basic of metabolic disorders/diseases and their manifestation, diagnosis and treatment.

UNIT – I SPECIMEN COLLECTION AND ANALYSIS   15 hrs

Concepts of accuracy, sensitivity, precision, reproducibility, reliability, and other factors in quality control. Normal values. Specimen collection and Processing, Collection of blood – Venipuncture, skin puncture, arterial puncture. Anticoagulants. Collection and analysis of normal and abnormal urine – timed urine specimens, preservatives Clinical significance of sugars, proteins, ketone bodies, bilirubin and porphyrins. CSF – collection, composition and analysis. Amniotic fluid - collection, composition. Preservations of biological samples.

UNIT – II DISORDERS OF CARBOHYDRATES AND LIPID METABOLISM   15 hrs

Disorders of carbohydrate metabolism – blood sugar levels, hyper and hypoglycemia, regulation of blood glucose, renal threshold, diabetes mellitus-etiologic classification and diagnostic criteria, glucose tolerance test, Hb A_{1c}, fructosamine, and microalbuminuria, metabolic complications-acute and late complications. Hypoglycemic agents, Glycogen storage diseases, galactosemia, fructose intolerance and Fructosuria. Plasma lipids, lipoproteins and apolipoproteins abnormalities and role in diseases. Hyper cholesterolemia, Hypocholestremic agents, lipidosis and hypolipoproteinemas, Taysach's disease, Niemann pick disease, Xanthomatoses, Gaucher's disease, Fatty liver, Obesity, Atherosclerosis, Risk factors.

UNIT – III DISORDERS OF PROTEIN METABOLISM   15 hrs

Disorders of protein metabolism – non-protein nitrogenous constituents in blood – urea, uric acid and creatinine. Plasma protein abnormalities – deficiency, agammaglobulinemia, multiple myeloma, proteinuria, glomerulonephritis, nephritic syndrome. Haemoglobinopathies – Sickle cell anemia, thalassemia and erythrocyte enzyme disorders. Phenylketonuria, Tyrosinosis, Alkaptonuria, Maple syrup urine disease, Hartnup disease, Homocystinuria, Albinism, Disorders of Urea Cycle. Bense Jones protein.

UNIT – IV HEPATIC, RENAL AND GASTRIC FUNCTION TESTS   15 hrs

Normal structure and functions of liver, diseases of liver, hepatitis, cirrhosis, alcoholic liver disease, hepatic tumor and biliary tract diseases, disorders of bilirubin metabolism. Acute and chronic renal failure, urinary tract obstruction and analysis of urinary calculi. Liver, Renal, pancreatic and gastric function tests.

**UNIT – V FREE RADICALS CANCER AND DISORDERS OF NUCLEIC ACID
METABOLISM**   **15 h**

Free radicals in health and disease – Endogenous and exogenous free radicals. ROS, Oxidative damage to lipids, proteins and DNA. Role of enzymatic and non-enzymatic antioxidants. Cancer, characteristic features, types. Tumor markers – AFP, CEA, hCG. Carcinogenic agents. Inborn errors of Nucleic Acid metabolism. Lesch nyhan syndrome, Immuno deficiency diseases associated with defects in Purine nucleotide metabolism, Gout, Oratic aciduria and Xanthinuria.

TEXT BOOKS:

10. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee publishers
11. Clinical chemistry in diagnosis and treatment – P.D. Mayne, ELBS/Arnold, N.Delhi.
12. Text book of Biochemistry with Clinical correlation by T.M.Devlin (1994) John Wiley and Sons.

BOOKS RECOMMENDED:

15. Clinical chemistry in diagnosis and treatment, Joan F.Zilva, PR Pannall, Liyods – Luke (medical books ltd., Lon)
16. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
17. Medical Laboratory Science, Theory and Practice J. Ochei and A. Kolhatkar, Tata Mc Graw - Hill.
18. Principles of internal medicine (1998) – Harrison, T.R. Fauci, Branuwalad and Isselbaeher, McGraw Hills.
19. Clinical chemistry – W.J. Marshall and S.K.Bangert (1995)
20. Text books of medicine – K.V. Krishnedas (1996), Jaypee Brothers.
21. Text book of Clinical chemistry –Teitz.
22. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.

PAPER- XVIII
CORE PRACTICAL VII
HEMATOLOGY AND MOLECULAR BIOLOGY

Paper Code: **Hrs: 5Hrs/Week**

Credits: 3   **TotalPractical: 15**

HAEMATOLOGICAL METHODS
1. Collection and storage of Blood
2. Total RBC count
3. Total WBC count
4. Differential WBC count
5. Total Platelet count
6. Absolute Eosinophil count
7. Determination of Hemoglobin content
8. Determination of Clotting time and Bleeding time
9. Determination of Prothrombin time
10. Determination of ESR
11. PCV
12. Preparation of Blood smear
13. Pathological examination of Blood film
14. Blood grouping& Rh typing, Du- factor
15. Cross matching
16. CBC using cell counter

Molecular Biology
1. SDS – PAGE determination of molecular weight of protein
2. Native gel electrophoresis – SOD, CAT (Activity Staining)
3. Molecular weight determination of DNA
4. ELISA – Demonstration
5. Extraction of genomic DNA and Electrophoresis in agarose gel. (Demonstration)
6. Agarose gel electrophoresis
7. Ligation teaching kit
8. Restriction enzyme digestion and electrophoresis (Demonstration)
9. Plasmid DNA isolation
10. PCR
11. Semidry blotting

REFERENCE BOOKS:
13. Sambrook, J. et al., 2001, Molecular Cloning – A Laboratory Manual. Spring Harbor Laboratory Press, New York.
14. Medical Laboratory technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and Co.Ltd., Vol.I,II,III.
15. Text book of Medical Biochemistry – 4th Edition, MN.Chatterjee, Rana Shine, Jaypee Publications.
16. Practical Clinical Biochemistry- Harold Varley, CBS, NewDelhi.
17. Text book of Clinical chemistry –Teitz.
18. Experimental procedures in Life Sciences by Dr.S.Rajan & Mrs.R.Selvi Christy. Anjaana Book House.
19. Medical Laboratory Science, Theory and Practice J. Ochei & A. Kolhatkar, Tata Mc Graw - Hill.

PROJECT COURSE WORK - RESEARCH METHODOLOGY

Paper Code: **5**
Hrs/Week-
Credits : 4
         Total-75Hrs
Objectives: to have knowledge about collection of data, thesis & paper writings and use of various tools in research.

UNIT – I: SCIENTIFIC WRITING
         15Hrs
Importance and need for scientific research. Ethics and scientific research. Formulation of hypothesis. Types and characteristics designing a research work. Scientific writing characteristics – logical format for writing thesis and papers. Essential features of abstract. Effective illustration – tables and figures. Reference styles – Harvard and Vancouver systems.

UNIT – II: RESEARCH ETHICS
                                                                                                        15
Hrs
Declaration of Bologina. Ethics in animal experimentation. CPSEA guidelines – Animal care and technical personnel environmental, animal husbandary, feed, bedding, water, sanitation and cleanliness, waste disposal, anesthesia and euthanasia. Environment, health and safety.

UNIT – III: RESEARCH PRACTICES
         15Hrs
Good laboratory practices, Good clinical practice, (GCP), schedule and phases of clinical trials, composition of (Human) institutional Ethical Committee (IEC) – General ethical issues. Specific principles for chemical evaluation of drugs, herbal remedies and human genetics research, Ethics in food and drug safety. Environmental release of micro organisms and genetically engineered organisms. Ethical issues in human gene therapy and human cloning. FDA and EMA.

UNIT – IV: STATISTICAL METHODS
                                                                                                        1
5Hrs
Collection and classification of data – Diagrammatic and graphic representation of data – measurement of central tendency – standard deviation – normal distribution – test of significance based on large samples – small samples – student's test – correlation and regression – Chi square test for independence of attributes – ANOVA. Use of SPSS software.

UNIT – V : BIOINFORMATICS

15Hrs
Introduction to Bioinformatics – database concepts, data base management system, database security, biological databases – types. Sequences and structures. Genome and organism specific database. Data submission and data retrieval. Searching sequence data base sequence similarity searches, Aminoacids substitution matrices. Data base search – FASTA and BLAST and CLUSTAL.

TEXT BOOKS:
    1. Research Methodology – Gurumani, MJP publishers

2. Research Methodology – Methods & Techniques.. Kothari, CR, Wishwa Prakashan
3. Research Methodology a hand Book, Misra, RP, Concept Publishing Company, New]
4. Statistical Methods, Sultan Chand & Sons, Gupta, S.P., 1990,
5. How to write a scientific paper R.A. Day.. Cambridge University Press.

BOOKS RECOMMENDED:

1. Krane *et al*., Fundamental concepts of Bioinformatics, Benjamin Cummings.
2. Sundar rao, Jesudian Richard – An introduction to Biostatistics
3. S.P.Gupta – Fundamentals of Statistics, Sultan Chand
4. Ethics and use of alternatives to animals in research and education, Shiranee Pereira, PCSEA.
5. Ethical guidance for Biomedical Research on Human Subjects, ICMR, NewDelhi, 2000.
6. Cooray P.G. Guide to scientific and technical writing.
7. Carter V. Good and Douglas E. Seats method of research.
8. Alley, Michael. The craft of scientific writing. Angle woods Cliffs. N.N.Prentice (1987).

Core VII – PLANT AND ANIMAL BIOTECHNOLGY

Semester: III   **Sub code: P3BT3001 Hrs/**
week: 6   **Credits: 4**

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 and gene silencing, chloroplast transformation; Applications of plant transformation for productivity and performance : abiotic stress, use of ACC synthase, polygalacturanase, ACC oxidase, male sterile lines. Applications of plant transformation for productivity,performance and resistance to insects, nematodes, virus, RIP, coat protein mediated,disease resistance, PR proteins.

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, cryo-preservation and transport of animal germplasm (i.e. semen, ova and embryos).

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 biotchnology

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

CORE 8 – ENZYMES AND FERMENTATION TECHNOLOGY

Semester: III   Sub. Code : P3BT3002
Hours   : 6   Credits   : 4

Unit - 1   Introduction of Enzymes - Classification and nomenclature of Enzymes, General properties of enzymes, Lock and Key and induced fit hypothesis, factors influencing Enzyme activity, effect of pH- Temperature - Ions etc. Extraction - assay and purification of enzymes. Steady state kinetics - Michaelis – Menten equation, different types of inhibitors.

Unit – 2 Enzymes structure, function and mechanism: Lysozyme, DNA polymerase and RNAse. Mechanism of enzyme catalysis, Role of coenzymes and metals. Regulation of enzyme activity. Allosterism, positive and negative modulations, zymogens, covalent modifications. Clinical and Industrial applications of Enzymes. Immobilizations of Enzymes and their applications. Enzyme engineering. Biosensors and their industrial applications.

Unit – 3 Introduction to Fermentation – Major types of organisms used in fermentation. Microbial growth kinetics, Batch culture, Continuous Culture, Fed – Batch; Types and applications, fermentation kinetics. Media for industrial fermentations – media formulation.

Unit-4 Fermentation process types and control system: Analysis of batch fed batch and continuous fermentation, stability of microbial reactors, analysis of mixed microbial populations, specialized Bioreactors (pulsed, fluidized, Photobioreactors etc). Control of fermentation – design of fermentation control systems, sensors and controllers. Control of incubation, aeration and agitation. Computer application in fermentation technology - off-line / online measurements – PID.

Unit-5 Downstream processing and application of fermentation: Removal of microbial mass and solid matter. Foam separation, filtration, precipitation, centrifugation, cell disruption, liquid – liquid extraction, chromatography, membrane process, drying and crystallization. Fermented foods, industrial production of solvent (glycerol), Alcohol (ethanol), Acid (citric acid), Antibiotic (penicillin) and Amino acids (lysine).

Reference Books:

1. Lehninger, A.L., Nelson, D.L. and Cox, M.M. **Principles of Biochemistry** CBS Publishers and Distributors.
2. Alan Fersht W (1995) **Enzyme structure and Mechanisms,** H. Freeman and Company New York.
3. Nicolas Price & Lewis Stevens (2005) **Fundamentals of Enzymology,** 2nd edition, Oxford Univ. Press, New York, NY.
4. Trevor Palmer **Understanding Enzymes,** Second Edition, J. Wiley & Sons, New York.
5. Voet D & Voet J. D. **Biochemistry,** J. Wiley & Sons, New York.

6. Stryer's **Biochemistry**, H. Freeman and Company, NY.
7. Prescott LM, Harley JP, Klein DA. (1996) **Microbiology**, Wm.C. Brown Publishers.
8. Alba. S, Humphrey, A.E and Millis N.F. (1973) **Biochemical engineering**, Academic press, NY.
9. Atkinson B, (1974) **Biochemical Reactors,** Pion Ltd, London.
10. Stanbury P. F Whittaker A, and Hall S. J. (1995) **Principles of Fermentation Technology,** 2nd Edition, pergamon press, Oxford.
11. Jackson A.T, Prentice Hall and Engelwood Cliffs (1991) **Process engineering in Biotechnology.**
12. Nielson J, Villadsen J (1994) **Bioreactor Engineering Principles**, Plenium Press.
13. Patel **Industrial Biotechnology.**

Practical **V** – **PLANT AND ANIMAL BIOTECHNOLGY**

Semester: III   **Sub code**: **P3BTPR31**
Hrs/ week: 3
       Credits: 3

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. MTT Assay.
10. Silver staining of protein.
11. Isolation of DNA from animal source.
12. Isolation of RNA from animal source.
13. Southern Blotting.

PRACTICAL 6 – ENYZMES AND FERMENTATION TECHNOLOGY

Semester: III   **Sub. Code:**
P3BTPR32
Hrs / week : 3   **Credits   : 3**

1. Effect of Substrate concentration on Activity of salivary Amylase.
2. Effect of Substrate concentration on Activity of Invertase.
3. Specific activity of Amylase.
4. Immobilization of enzyme Catalase.
5. Enzymatic Assay of Catalase.
6. Activity of Invertase from Baker's yeast.
7. Effect of NaCl on Amylase activity.
8. Inhibition of Alkaline Phosphatase activity by EDTA.
9. Anatomy of fermenter, cleaning and assembling.
10. Anatomy & calibration of Fermenter electrodes / probes.
11. Production of Biomass, batch, fed – batch and continuous fermentation. - demo
12. Laboratory scale fermentation of Antibiotics.

Reference Books:
1. An Introduction to Practical Biochemistry by Rodney Bayer (2003).
2. Practical Biochemistry by Wilson & Walker (1994) Cambridge University Press.
3. Laboratory Manual of Biochemistry by J. Jayaraman (1988) Wiley Eastern.
4. Molecular cloning by J. Sambrook and D. W Russell (2001)
5. Applied Plant Biotechnology by S. Ignacimuthu (1996) McGraw Hill, New Delhi.
6. Microbiology – A laboratory Manual by J. G Cappuccino and N. Sherman (2004).

Elective 3 –AQUACULTURE BIOTECHNOLOGY

Semester : III   **Sub. Code :**
P3BTE301
Hrs/ week : 6   **Credits : 4**

Unit 1. Principles of aquaculture and Aqua farm engineering

Definition, history and scope of aquaculture, constraints and recent advances in aquaculture, criteria for selection of species. Design and construction of aqua – hatcheries, aeration in aquaculture types and design, equipments, automatic feeders Heaters ,Thermostats,Filters-Under gravel, power filter.

Unit 2. Fish breeding

Induced breeding, hypophysation, different ovulating agents, hatchery and bundh
breeding, multiple breeding, natural collection of seed, live transportation of brood fish and seed.

Unit 3. Feed formulation and Live food culture technology

Types of feeds, feed ingredients and their selection, formulation and preparation of feed, , feed attractants and preservatives. Natural food and their importance. Methods of collection, maintenance and rearing of fish food organisms

Unit 4. Disease diagnosis and Parasitic diseases

Principles of disease diagnosis in fish .Clinical diagnosis, histopathological and haematological methods. Diseases caused by bacteria, fungi and viruses, their prophylactic and therapeutic measures.

Unit 5. Ornamental fish

Aquarium ornamental fishes, their breeding and culture,-Guppy Molly,Gold fish Fighter, Angel and Morph. Common aquarium plants and their multiplication.
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Reference Books:
1. Encyclopedia of Ornamental fishes. Herbert Axel rod – T.F.H. pub. NewJercy. (1992)
2. Hand Book of aquarium fishes. Dr.Schultz and H.Axel rod. (1980)
3. Fish and fisheries of India by Jhingran (2000).

Non Major – BIOPHYSICS, BIOSTATISTICS AND BIOINFORMATICS
Semester: III   Sub code: **P3BTNM**
Hrs/ week: 6
         Credits: 4

Unit I

Thermodynamics - basic concept. Laws of thermodynamics, Enthalpy and Entropy Free Energy- standard free energy. Exothermic and endothermic reactions. Heat dissipation and heat conservation. Primary events in Photosynthesis. Strategies of light reception in microbes, plants and animals. Electrical properties of biological components.

Unit II

Physical methods applied to find out molecular structure: X-ray crystallography and NMR. General Spectroscopy, Lambert-Beer Law, Spectrophotometry & Colorimetery, UV-VIS, Fluorescence, AAS, IR, Raman Spectra.

. **Unit III**

Collection, classification, Tabulation and diagrammatic and graphical Representation of statistical data: Histogram, pie chart, bar diagram, frequencyPolygon and frequency curve.

Measurement of central tendency: Mean, Median, Mode. Measurement of dispersion: Standard Deviation and standard curve.

Unit IV

Introduction to internet use and search engines: www, HTML, URLs, browsers: Netsc ape (opera) Explorer, Search engines: Google, PubMED, Sequence information sources (Structure and use on web): EMBL, GENBANK, Entrez, Unigene. Protein information sources (Structure and use on web): PDB, Swissprot, TrEMBL

Unit V

Molecular modeling: introduction, dynamic simulation, conformational search, molecular modeling packages (Chem3D, Hyperchem), protein modeling, structure prediction and molecular docking.

Reference Books

1. Practical Biochemistry by K. Wilson and I. Walker 5th edition, Cambridge university press (2000)
2. Biostatistics by P.N. Arora and P. K. Malhan, Himalaya Publishing House.
3. Lesk, A. M. Introduction to Bioinformatics oxford 2002.
4. Krane et al Fundamental concept of Bioinformatics Benjamin cummings.

CORE 9 – ENVIRONMENTAL BIOTECHNOLOGY

Semester: IV   **Sub. Code: P3BT4001**
Hours   : 6   **Credits   : 4**

Unit – 1 Concepts of Ecosystems, Management of Ecosystems, biogeochemical cycling in ecological systems. Response of microbes, plants and animals to environmental stress. Environmental problems – ozone depletion, global warming, green house effects. Soil, Water, Air, Thermal and Nuclear pollution – causes, effects and control measures.

Unit – 2 Microbiology of waste water treatment – Physical, Chemical and Biological waster water treatment methods. Aerobic treatment – Activated sludge process, oxidation ponds, oxidation ditches, trickling filters. Anaerobic treatment – Anaerobic digestion, anaerobic distillery UASB reactor. Role of microphyte and macrophyte in water treatment. Recent approaches to waste water treatment (Reverse Osmosis).

Unit – 3 Solid waste management – sources, types of solid wastes, strategies for solid waste management (composting and methane production), treatment of hazardous wastes. Bioremediation – in-situ and ex-situ bioremediation, phytoremediation of soil metals, bioremediation of contaminated ground water, bioremediation of xenobiotics (hydrocarbons, polychlorinated biphenyls, oil spillage). Use of GMO's in bioremediation (super bug).

Unit – 4 Pesticides and its effects on environment. Bio-pesticides in integrated pest management. Bioplastics – PHA, PHB, Biopol – A. Biofuel – Production of Alcohol, Methane, Hydrogen from Biomass, the future application.

Unit – 5 Scope of Biotechnology in Environmental protection. Non conventional energy resources. Environmental protection Act – Environmental laws, Environmental policies, Environmental ethics and UN declaration. Environment protection and conservation, Environment impact assessment, Eco-planning and sustainable development.

Reference Books:
1. Metcalf and Eddy, (1991) **Wastewater Engineering – Treatment, Disposal and Reuse,** Tata McGraw Hill, New Delhi.
2. Allsopp D and Seal K. J., **Introduction to Biodeterioration,** ELBS / Edward Arnold Cambridge University Press.
3. Cunningham W. P., and Saigo B. W., (1999) **Environmental Science,** 5th Edition, McGraw Hill.
4. Odum E. P., and Barrett G. W., (2005) **Fundamentals of Ecology,** 5th Edition, Thomson Books / Cole.
5. Milton Wain Wright (1999) **An Introduction to Environmental Biotechnology,** Kluwar Acad. Publ. Group, Springer.
6. Nicholas Cheremisinoff P., (2001) **Biotechnology for Wastewater Treatment,** Prentice Hall of India.
7. Gray N. F., (2004) Biology for Wastewater Treatment, McGraw Hill.
8. Abbasi S. A and Ramaswami E., (1999) **Biotechnological Methods for Pollution Control,** University Press.

Unit – 1 General information on microbes based industries – Major classes of commercial products using microbes – Enzymes, Amino acids, Vitamins, Antibiotics, Food and Beverages.

Unit – 2 Industrial use of microorganisms – isolation, preservation and maintenance of microorganisms. Selection of natural variants – important characteristics, screening methods. Strain improvement – Random mutagenesis and site directed mutagenesis. Isolation of induced mutants synthesizing improved levels of primary and secondary metabolites. Microbes exploited commercially – Saccharomyces, Lactobacillus, penicillium, Acetobacter, Bifidobacterium, lactococcus, streptococcus.

Unit – 3 Medium requirement for fermentation process – Carbon, Nitrogen, Minerals, Vitamins and other nutrients. Addition of precursors and metabolic regulators to media and medium optimization. Fermenter – Design, Functions and Types. Quorum sensing in Bioprocess.

Unit – 4 Microbial enzymes in food processing – Industrial production of enzymes – proteases, amylas, invertase, pectinase and cellulases. High Fructose Corn Syrup (HFCS). Food products – Cheese, yoghurt, jelly. Beverages – Alcoholic and Non – alcoholic beverages. Food additives and supplements – probiotics, Healthcare products, Neutraceuticals, Vitamins and Anitbiotics.

Unit – 5 Mass cultivation of Spirulina, Single Cell Proteins (SCP), Petrocrops. Improvement of nutritional value of seed storage proteins. Biofertilizers – *Azospirillum, Azolla, Rhizobium, Frankia,* VAM. Mass production of phosphate solubilizing bacteria. Natural Biopreservatives. Biopolymers. Biopesticides – genetic engineering of plants for pest and herbicide resistance. Current status of industrial biotechnology in India.

Reference Books:
1. Stanbury P. F and Whittaker H., (1997) **Principles of Fermentation Technology,** Aditya Books (Pvt) Ltd, New Delhi.
2. Purohit and Mathur (1993) **Basic and Agricultural Biotechnology.**
3. Prescott and Dunn., **Industrial Microbiology.**
4. Gutierrez Lopez G. f., et. al., (2003) **Food Science and Food Biotechnology,** CRC Publishers, Washington.
5. Waites M. J., et. al., (2007) **Industrial Biotechnology – An Introduction,** Blackwell Publishers, UK.
6. Casida L. E., (2007) **Industrial Microbiology,** Wiley Publishers.
7. Cruegar F and Anne Liese Cruegar (2001) **Industrial Microbiology**.

Core 12 :: Course Work – RESEARCH METHODOLOGY

Semester : IV   **Sub. Code : P3BT4003**

Hrs/ week : 5   **Credits : 4**

UNIT-I : Research: Basic and applied research – objectives of research – types of research – criteria of good research – hypothesisation – parameters of research - stages in the execution of research

UNIT II : Journal: Standard research **journals** – impact factor – citation index – information retrieval –databases – search engines – google, pubmed NIC – network services – online data book library - format of journal – proof reading – sources of information – journals, reviews, short communication, books, monograph & bibliography.

UNIT III : Mechanics of writing: Spelling – punctuation – italics – names of persons – numbers – quotations – abbreviations – margins – spacing – heading – corrections – insertions - preparation of manuscript – report writing

UNIT IV : Statistical Methods: Sampling methods –variables – mean, mode, median, SD, SE, correlation & regression, t-Test, ANOVA. Statistical Tools: SSPP10. Bioinformatics Tools: BLAST, RASMOL, NCBI, EMBL & DDBT – protein sequence database – swis port and PDB

UNIT V : Biotechnological Tools: AGE, SDS-PAGE, Gel documentation – Immunotechniques – Blotting techniques – DNA finger printing – RFLP, RAPD, AFLP, PCR

REFERENCES:

1. MLA hand book for writers of research paper. Joseph Gibaldi, 6th edn. Affiliated East-West press Pvt ltd, New Delhi, India
2. Research methodology by Kothari
3. Research methodology by Gurumani
4. Writing the Doctoral Dissertation – Barrons Educational Series 2nd edn, Davis, G.B. and C.A. Parker, 1997
5. Authoring a Ph.D thesis: How to plan, draft, write and finish a doctoral dissertation, Duncary, p. 2003, Mac million Pub.
6. How to write & publish a scientific course, 5th Edn, Robert A. The Oxford Press

Core 11 - HERBAL TECHNOLOGY

Semester : IV   **Sub. Code : P3BT4004**
Hrs/ week : 5   **Credits : 4**

Unit I: General Introduction:
Definition, source of herbal raw materials, identification, authentication. Basic Knowledge of Siddha, Ayurvedia, Unani, Homeopathy. 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

Semester: IV   **Sub. Code:
P3BTPR41**

Hrs / week : 3   **Credits   : 3**

1. Rate of O_2 Consumption under temp stress by fish.
2. Estimation of Dissolved Oxygen.
2. Estimation of Total Dissolved Solids / Total Suspended Solids.
3. Estimation of Alkalinity / Salinity.
4. Determination of BOD / COD from sewage sample.
5. Isolation of Xenobiotic degrading bacteria – by selective enrichment technique.
6. Microbial degradation of cellulose.
7. Immobilization of yeast cell.
8. Production of Ethanol.
9. Isolation of industrially important microbes for microbial processes.
10. Microbial production of citric acid using *Aspergillus niger*.
11. Microbial production of Antibiotics.
12. Isolation of Rhizobium form root nodules of higher plants
13. Testing purity of milk by assessing microbial presence.
14. Extraction of phytochemical
15. Test for alkaloid,Flavonoids, Saponins, Terpinoid
16. Extraction methods – aquos, Ethanolic, etc.

Reference Books:

1.   Waste water Engineering – Treatment, Disposal and Reuse. Metcalf and Eddy Inc. Tata McGraw Hill, New Delhi (1991)

2. Principles of Fermentation Technology by PF Stanbury, A. Whittaker and S. J Hall. 2nd Edition, Pergamon Press, Oxford (1995)

3.   Molecular Cloning – A Laboratory Manual Vol – I – III by Sambrook et. al., (2001) cold spring Harbor laboratory press, New York.

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M.Sc., (Computer Science)
III Semester   DIGITAL IMAGE PROCESSING
(for candidates admitted from 2013-14)

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Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives: To inculcate a basic training in the processing of images for practical applications in the domain of medical, remoting sessions and in general.

UNIT - I
        18 Hours
Introduction: What is Digital Image Processing? – Examples of Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – Components of an Image processing System – Digital Image Fundamentals: Elements of Visual Perception – Light and Electro Magnetic Spectrum – Image sensing and Acquisition – Image Sampling and Quantization – Some Basic Relationships between Pixels.

UNIT - II
        18 Hours
The Image, its Mathematical Background: Overview – Linear Integral Transforms. Data Structures for Image Analysis: Level of Image Data Representation – Traditional Image Data Structures – Hierarchical Data structures. Image Pre-processing: Pixel Brightness Transformations - Geometric transformations – Local pre-processing: Image smoothing, Edge Detectors – Image Restoration.

UNIT - III
        18 Hours
Segmentation : Thresholding – Edge Based Segmentation : Edge Image Thresholding, Border tracing - Region Based Segmentation – Matching – Shape Representation and Description: Region Identification – Contour Based Shape Representation and Description- Chain codes, Simple Geometric Border Representation - Region Based Shape Representation and Description, Simple Scalar Region Descriptors.

UNIT - IV
        18 Hours
Object recognition: Knowledge Representation – Statistical Pattern Recognition – Neural Nets – Fuzzy Systems- Mathematical Morphology – Basic Morphological concepts – Binary Dilation and Erosion.

UNIT - V
        18 Hours
Image Data Compression: Image Data Properties – Discrete Image Transforms in Image Data Compression – Predictive Compression Methods – Vector Quantization – Hierarchal and Progressive Compression Methods – Comparison of Compression Methods – Coding –JPEG Image Compression.

Total : 90 Hours
TEXT BOOKS

1. Rafael C. Gonzalez, Richard E.Woods, Digital Image Processing, Prentice Hall, Third Edition, 2008. (Unit-1: Chapter 1-1.1, 1.3, 1.4, 1.5, Chapter 2 -2.1, 2.2, 2.3, 2.4, 2.5).
2. Sonka, Hlavac, Boyle, Digital Image Processing and Computer Vision, Cengage Learning, 2009 (Unit -II: Chapter 3 – 3.1, 3.2 ,Chapter-4, Chapter-5,5.1, 5.2,5.3, 5.3.1, 5.3.2, 5.4
  Unit-III: Chapter 6 -6.1, 6.2, 6.2.1, 6.2.3., 6.3, 6.4, Chapter 8 – 8.1, 8.2,8.2.1,8.2.2, 8.3, 8.3.1
  Unit-IV: Chapter 9,9.1,9.2, 9.3,9.7, Chapter 13- 13.1, 13.3
  Unit-V: Chapter 14- 14.1, 14.2, 14.3, 14.4, 14.5,14.6, 14.8, 14.9,14.9.1)

REFERENCES:
1. Anil.K.Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1989.
2. Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall, 3rdEdition

M.Sc., (Computer Science)
III Semester   INFORMATION & NETWORK SECURITY
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To study the critical need for ensuring Information Security in Organizations

UNIT I : INFORMATION SECURITY
        15 Hours
History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II : SECURITY INVESTIGATION
        15 Hours
Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III : SECURITY ANALYSIS
        15 Hours
Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV: ATTACKS, SERVICES & MECHANISMS:
        15 Hours
Security attacks – Security services – Network Security Model. Conventional Encryption: Classical Techniques: Conventional Encryption model - Stenography – Classical Encryption Techniques- Modern Techniques**:** The Data Encryption Standard – The Strength of DES – Differential and Linear, Crypto-analysis.

UNIT V : PUBLIC KEY CRYPTOGRAPHY:
        15 Hours
Principles of public-key cryptosystems – The RSA algorithm - Key management – Diffie-Hellman key exchange – Elliptic curve cryptography

        Total : 75 Hours

TEXT BOOK:
1. Principles of Information Security, Michael E Whitman and Herbert J Mattord, Vikas Publishing House, 2003
2. Cryptography and Network security – Principles and Practice , William Stallings, 2nd Edition, Pearson Education, 2002.

REFERENCES:
1. Handbook of Information Security Management, Micki Krause, Harold F. Tipton, Vol 1-3 CRC Press LLC, 2004.

2. Hacking Exposed , Stuart Mc Clure, Joel Scrambray, George Kurtz, Tata McGraw Hill, 2003
3. Computer Security Art and Science, Matt Bishop, , Pearson/PHI, 2002.

M.Sc., (Computer Science)
III Semester   BUSINESS INTELLIGENCE AND DATA MINING
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives:
To expose the students to the concepts of Data warehousing Architecture and Implementation and to Understand Data mining principles and techniques

UNIT I : DATAWAREHOUSE
        15 Hours
Data Warehousing - Operational Database Systems vs. Data Warehouses - Multidimensional Data Model - Schemas for Multidimensional Databases – OLAP Operations – Data Warehouse Architecture – Indexing – OLAP queries & Tools.

UNIT II : DATAMINING & DATA PREPROCESSING
        15 Hours
Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT III : ASSOCIATION RULE MINING
        15 Hours
Introduction - Data Mining Functionalities - Association Rule Mining - Mining Frequent Itemsets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

UNIT IV : CLASSIFICATION & PREDICTION
        15 Hours
Classification vs. Prediction – Data preparation for Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT V : CLUSTERING
        15 Hours
Cluster Analysis: - Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density-Based

Methods – Grid-Based Methods – Model-Based Clustering Methods – Clustering High-Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.

Total : 75 Hours

TEXT BOOK:
Data Warehousing, Data Mining, and OLAP , Berson,Alex & Smith, Stephen J, Tata McGraw Hill, 2012

REFERENCES:
1. Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Elsevier, 2nd Edition, Reprinted 2008.
2. Insight into Data mining Theory and Practice, K.P. Soman, Shyam Diwakar and V. Ajay, Easter Economy Edition, Prentice Hall of India, 2006.
3. Introduction to Data Mining with Case Studies, G. K. Gupta Easter Economy Edition, Prentice Hall of India, 2006.
4. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach and Vipin Kumar Pearson Education, 2007

M.Sc., (Computer Science)
III Semester   DIGITAL IMAGE PROCESSING LAB
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

LIST OF EXERCISES
1. Arithmetic Operation on Images
2. Bit Planes Slicing
3. Contrast Enhancement
4. Geometric Transforms
5. Low Pass and High Pass Filters
6. Quantization Reduction
7. Reading Writing Images
8. Simple Image Manipulation
9. Spatial Resolution Reduction
10. Water Marking

REFERENCE:
Lab Manual

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives :
To provide an exposure to current and emerging trends in computer architecture,
focussin on performance and the hardware / software interfaces.

UNIT I : INSTRUCTION LEVEL PARALLELISM
        18 Hours
ILP – Concepts and challenges – Hardware and software approaches – Dynamic
scheduling – Speculation - Compiler techniques for exposing ILP – Branch prediction.

UNIT II : MULTIPLE ISSUE PROCESSORS
        18 Hours

VLIW & EPIC – Advanced compiler support – Hardware support for exposing
parallelism – Hardware versus software speculation mechanisms – IA 64 and Itanium
processors – Limits on ILP.

UNIT III : MULTIPROCESSORS AND THREAD LEVEL PARALLELISM
        18 Hours

Symmetric and distributed shared memory architectures – Performance issues –
Synchronization – Models of memory consistency – Introduction to Multithreading.

UNIT IV : MEMORY AND I/O
        18 Hours
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time –
Main memory and performance – Memory technology. Types of storage devices –
Buses – RAID – Reliability, availability and dependability – I/O performance measures
– Designing an I/O system.

UNIT V : MULTI-CORE ARCHITECTURES
        18 Hours
Software and hardware multithreading – SMT and CMP architectures – Design issues –
Case studies – Intel Multi-core architecture – SUN CMP architecture – heterogenous
multi-core processors – case study: IBM Cell Processor.

        Total : 90 Hours

TEXT BOOK:
Computer architecture – A Quantitative Approach , John L. Hennessey and David A.
Patterson,
 Morgan Kaufmann, Elsevier Publishers, 4th Edition, 2007.

REFERENCES:
1. Parallel computing architecture : A Hardware/Software approach David E. Culler, Jaswinder Pal Singh, Morgan Kaufmann /Elsevier Publishers, 1999.
2. Scalable Parallel Computing , Kai Hwang and Zhi.Wei Xu, Tata McGraw Hill, 2003.

M.Sc., (Computer Science)
III Semester   THEORY OF COMPUTATIONS
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objective : To introduce the advanced concepts in theory of computations and the grammar of context free languages.

UNIT I : AUTOMATA
        12 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.

UNIT II: REGULAR EXPRESSIONS AND LANGUAGES
        12 Hours
Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III : CONTEXT-FREE GRAMMARS AND LANGUAGES
        12 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.

UNIT IV : PROPERTIES OF CONTEXT-FREE LANGUAGES
        12 Hours
Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.

UNIT V : UNDECIDABALITY
        12 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.

        Total : 60 Hours

TEXT BOOK:

Introduction to Automata Theory, Languages and Computations, J.E. Hopcroft, R. Motwani and J.D. Ullman, Pearson Education, 2nd Edition, 2007.

REFERENCES:
1. Elements of the theory of Computation , H.R. Lewis and C.H. Papadimitriou, Pearson Education, 2nd Edition, 2003.
2. An Introduction to the Theory of Computer Science,Languages and Machines, Pearson Education, Thomas A. Sudkamp,3rd Edition, 2007.
3. Fundamentals of Theory of Computation, Principles and Practice , Raymond Greenlaw an H.James Hoover, Morgan Kaufmann Publishers, 1998.
4. Introduction of the Theory and Computation, Micheal Sipser, Thomson Brokecole, 1997.
5. Introduction to Languages and the Theory of computation , J. Martin,3rd Edition, Tata Mc Graw Hill, 2007

M.Sc., (Computer Science)
IV Semester   CLOUD COMPUTING
(for candidates admitted from 2013-14)

Subject Code :   Max Marks:100 - 75
(ESE) , 25 (CIA)

Objectives :
To introduce the concepts of cloud and related terms and various cloud services present currently.

UNIT – I : BASIC TERMINOLOGY
        18 Hours
Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT – II : CLOUD COMPUTING FOR EVERYONE
        18 Hours
Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedulesm managing projects, presenting on road.

UNIT – III : USING CLOUD SERVICES
        18 Hours
Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.

UNIT – IV : OUTSIDE THE CLOUD
        18 Hours

Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

UNIT – V : STORING AND SHARING
      18 Hours
Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

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l : 90 Hours**

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TEXT BOOK:
Cloud Computing , Michael Miller, Pearson Education, New Delhi, 2009

REFERENCES :
Mastering Cloud Computing, Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, McGraw Hill Education, 2013

M.Sc., (Computer Science)
IV Semester   HUMAN COMPUTER INTERACTION
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives :
To enable students to understand the various meanings of usability and how to build usability in products, product interfaces and product information.

UNIT - I
        12 Hours
Introduction : Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT - II
        12 Hours
Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT - III
        12 Hours
Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT - IV
        12 Hours
Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT - V
        12 Hours
Software tools – Specification methods, interface – Building Tools. Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

        Total : 60 Hours

TEXT BOOKS :

1. The Essential Guide to User Interface Design, Wilbert O Galitz, Wiley Dream Tech.
2. Designing the User Interface, Ben Shneidermann, Pearson Education Asia, 3rd Edition.

REFERENCES :

1. Human – Computer Interaction, Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson.
2. Interaction Design, Prece, Rogers, Sharps. Wiley Dream Tech,
3. User Interface Design, Soren Lauesen , Pearson Education.

M.Sc., (Computer Science)
IV Semester   PRINCIPLES OF COMPILER DESIGN
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives :
To provide an introduction to the system software like assemblers, compilers and macros. It provides the complete description about inner working of a compiler.

UNIT I : LEXICAL ANALYSIS
        18 Hours
Introduction to Compiling- Compilers-Analysis of the source program-The phases-Cousins-The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

UNIT II : SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS
        18 Hours
Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar-Topdown parsing-Bottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments-Source language issues-Storage organization-Storage-allocation strategies.

UNIT III : INTERMEDIATE CODE GENERATION
        18 Hours
Intermediate languages-Declarations-Assignment statements - Boolean expressions-Case statements- Backpatching-Procedure calls

UNIT IV : CODE GENERATION
        18 Hours
Issues in the design of a code generator- The target machine-Run-time storage management-Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The dag representation of basic blocks - Generating code from dags.

UNIT V : CODE OPTIMIZATION
18 Hours

Introduction-The principle sources of optimization-Peephole optimization-
Optimization of basic blocks-Loops in flow graphs- Introduction to global data-flow
analysis-Code improving transformations.

Total : 90 Hours
TEXT BOOK:

Compilers- Principles, Techniques and Tools , Alfred V. Aho, Ravi Sethi, Jeffrey D.
Ullman, Pearson Education Asia, 2007.

REFERENCES:

1. Modern Compiler Design , David Galles, Pearson Education Asia, 2007
2. Advanced Compiler Design & Implementation, Steven S. Muchnick, Morgan
Kaufmann Pulishers, 2000.
3. Crafting a Compiler with C, C. N. Fisher and R. J. LeBlanc, Pearson Education,2000.

M.Sc., (Computer Science)
IV Semester   COMPILER DESIGN LAB
(for candidates admitted from 2013-14)

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

LIST OF EXERCISES

1. Construction Of NFA
2. Construction Of Minimized DFA
3. Implementation Of Lexical Analyser Using Lextool
4. Implementation Of Symbol Table
5. Construction Of Operator Precedence Parse Table
6. Syntax Analysis Using YACC
7. Implementation Of Shift Reduce Parsing Algorithm
8. Construction Of LR Parsing Table
9. Implementation Of Intermediate Code Generation
10. Implementation Of Code Optimization Techniques
11. Conversion Of Infix To Postfix Expression
12. Implementation Of Quadraples
13. Implementation Of Triples
14. Generation Of Tokens For Given Lexeme
15. Parsing The String

REFERENCES:
Lab Manual

Subject Code :   **Max Marks:100 - 75**
(ESE) , 25 (CIA)

Objectives :
To learn the method of designing real time systems.

UNIT I : EMBEDDED COMPUTING
12 Hours
Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.

UNIT II : MEMORY AND INPUT / OUTPUT MANAGEMENT
12 Hours
Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

UNIT III : PROCESSES AND OPERATING SYSTEMS
12 Hours
Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.

UNIT IV : EMBEDDED SOFTWARE
12 Hours
Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.

UNIT V : EMBEDDED SYSTEM DEVELOPMENT
12 Hours
Design issues and techniques – Case studies – Complete design of example embedded systems.

Total : 60 Hours

TEXT BOOKS:
1. Computers as Components: Principles of Embedded Computer System Design ,
Wayne Wolf, Elsevier, 2006.
2. Embedded C , Michael J. Pont, Pearson Education , 2007.

REFERENCES:
1. Embedded System Design , Steve Heath, Elsevier, 2005.
2. The 8051 Microcontroller and Embedded Systems , Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, Pearson Education, 2nd edition, 2007.

ISLAMIAH COLLEGE (AUTONOMOUS)

M.A.HISTORY

VANIYAMBADI   III SEMESTER   CORE PAPER IX

SOCIAL AND CULTURAL HISTORY OF INDIA

FROM 1857 TO 2010 AD

UNIT I

Education in India: Growth and Development of Education in British India – Dr. Radhakrishnan Commission – University Grants Commission – Kothari Commission – New Education Policy of 1986, 1992 and 2005

UNIT II

Social Reform Movements in British India: Hindu, Muslim, Sikh and Parsi

UNIT III

Peasant Movements: Agrarian Crisis – Mapilla Rebellion

UNIT IV

Trade Union Movements and Its Impact

UNIT V

Art and Architecture – Cultural Development – National Academies

Books for Reference

1. Chandra, Bipin : India's Struggle for Independence, Penguin Books, New Delhi, 2000.

2. Chandra, Bipin, : India Since Independence , New Delhi, 2002.

3. Chandra Bipin, : Nationalism and Colonialism in Modern India, Orient Longman, New Delhi, 1999.

4. Majumdar, R.C, RayChaudhari, H.C and Kalikinkar Datta: An Advanced History of India, Macmillan Press, Madras, 1998.

5. Jones, Kenentah.W : Socio - Religious Reform Movements in British India, The New Cambridge History of India Series, Foundation Books, Cambridge University Press, New Delhi, 1994.

6. Sarkar, Sumit : Modern India 1885-1947, Macmillan Press, New Delhi, 2002

ISLAMIAH COLLEGE (AUTONOMOUS)

M.A.HISTORY

VANIYAMBADI   III SEMESTER CORE PAPER X

HISTORY OF MODERN CIVILIZATIONS

UNIT I

Geographical Discoveries – Renaissance – Reformation and Counter Reformation

UNIT II

French Revolution – Russian Revolution – Chinese Cultural Revolution

UNIT III

Industrial Revolution – Agricultural Revolution

UNIT IV

First World War – League of Nations - Second World War – UNO

UNIT V

Scientific, Intellectual and Technological Movements of the 19th & 20th Centuries – Inventions of the 20th Century – Information Technology Revolution

Books for Reference:

1. C.D.M. Kettleby, A History of Modern Times, S. Chand & Co.

2. C.D. Hazen, Modern European History, S. Chand & Co.

3. Ralph M. Stair, George Reynolds, George W. Reynolds, Fundamentals of Information Systems, Cengage Learning, 2008

ISLAMIAH COLLEGE (AUTONOMOUS)   M.A. HISTORY

VANIYAMBADI   III SEMESTER

CORE PAPER XI

HSTORIOGRAPHY

UNIT I

Meaning, Nature and Scope of History – Kinds of History – Use and abuse of History – History as a Science or an Art

UNIT II

History and other Social Sciences: History and Geography – History and Economics – History and Psychology – History and Sociology – History and Political Science – History and Literature

UNIT III

Causation in History: Theories of Causation – Divine Plan – Rationalist Theory – Nationalist Theory – Scientific Theory – Historical Schools

UNIT IV

Research Methodology: Selection of Topic – Historical Sources – External and Internal Criticism – Footnotes and Synthetic Operation

UNIT V

Indian Historiography – Ancient: Banabhatta – Bilhana and Kalhana – Medieval: Alberuni – Moulana Ziyauddin Barani – Abdul Hamid – Modern:Sri Willam Jones – Jadunath Sarkar –

K.M. Panikkar – Irfan Habib and Sheik Ali

Books for Reference:

1. Sheik Ali, History: Its Theory and Methods (New Delhi: Macmillan, 1980).

2. C.R. Kothari, Research Methodology: Methods and Techniques (New Delhi: 2002).

3. Estelle M. Phillips and D.S. Pugh, How to get a Ph.D.: A Handbook for Students and their Supervisors (New Delhi: UBS Publishers, 1987).

ISLAMIAH COLLEGE (AUTONOMOUS)   **M.A. HISTORY**

VANIYAMBADI   **III SEMESTER**

CORE PAPER XII

HISTORY OF THE OTTOMAN EMPIRE

UNIT I

The Origin of Ottoman Turks – Rise of Osmanlis – Establishment of the Kingdom – Administration under Orkhan – The Janissanis – Penetration in Europe

UNIT II

Muhammad II – The conquest of Constantinople – His achievements

UNIT III

Sulaiman the Magnificent – Reforms – Expansion and administration of the empire – The Ottoman as a World Power

UNIT IV

Administration and Military organization of the Ottomans

UNIT V

Development of Art, Architecture and Literature – Decline of the Ottoman Empire

Books for Reference:

 1. Sir Edward Creasy: Ottoman Turks

 2. Stanley Lane Pool: Turkey

 3. Gibbon, H.R. : The Foundation of the Ottoman Empire

4. P.K. Hitti : History of the Arabs

5. Ameer Ali : A Short History of the Saracens

ISLAMIAH COLLEGE (AUTONOMOUS)   M.A. HISTORY

VANIYAMBADI   III SEMESTER

ELECTIVE III

INTELLECTUAL HISTORY OF THE 20th CENTURY INDIA

UNIT I

India at the beginning of the 20th Century – Political Condition – Social Condition – Economic Condition – Course of Freedom Movement

UNIT II

Political Thought: B.G. Tilak – Lala Lajpat Rai – B.C.Pal – Mahatma Gandhi – B.R. Ambedkar – S.V. Patel – Subhash Chandra Bose – Jawaharalal Nehru – Moulana Abul Kalam Azad – Zakir Hussain – Jayaprakash Narayan – Indira Gandhi

UNIT III

Social Thought: Sir Syed Ahmed Khan – Vinoba Bhave – Dr.Muthulakshmi Reddy – Periyar E.V.R – Mother Theresa

UNIT IV

Socialists and Communists: M.N.Roy – S.A.Dange – Ram Manohar Lohia – E.M.S. Namboodripad

UNIT V

Litterateurs: Rabindranath Tagore – Muhammed Iqbal – Subramaniya Bharathi – Thiru.Vi.Ka. – Sarojini Naidu – Bharathidasan – Kavikko Abdul Rahman

Books for Reference

1. Ahluwalia, B.K: Sardar Patel – Rebel and Ruler, Akbe Group, New Delhi, 1981. Shashi

   Ahluwalia

2. Bharathi: Mahatma Gandhi, Man of the Millennium, S. Chand & Co, New Delhi, 2000.

3. D.K .Publications: On Periyar, Chennai.

4. Gopalakrishnan, M.D.: Periyar, Father of Tamil Race, Emerald Publishers, Chennai.

5. Grover, B.L. & Grover, S.: A New Look at Modern Indian History, (From 1707 to the Modern Times), S. Chand & Co, New Delhi, 2006.

CONSTITUTION OF INDIA

UNIT I

Origin and nature of the Constitution: Constituent Assembly and framing of the Constitution – Preamble – Salient Features of the Indian Constitution – Fundamental Rights – Fundamental Duties – Directive Principles of the State Policy

UNIT II

Union and State Executive: President of India – Election – Qualifications – Term of Office – Emoluments – Powers and Duties of the President – Vice President of India-Election – Qualifications – Term of Office – Emoluments – Powers and Duties of the Vice President – Council of Ministers – Ministerial Responsibilities – Powers and Functions of State Governor – State Council of Ministers – Indian Federalism at work

UNIT III

Union and State Legislature: Nature of Bicameral Legislature – Composition of Rajya Sabha and Lok Sabha – Elections and Quaifications – Powers and Functions of the Legislature – Powers and Functions of the Speaker and Deputy Speaker of Lok Sabha, Chairman and Vice Chairman of Rajya Sabha – State Legislative Council and Assemblies- Procedure of Amendments and Important Amendments

UNIT IV

Judiciary: Supreme Court – Composition, Powers and Functions – High Courts in the States – Judicial System of States – Impeachment procedure – Judicial Review-Important Judicial Decisions

UNIT V

Local Self-Government: 73rd and 74th Amendments and its Features – State Election and Finance Commission – Three Tier System of Rural Panchayats - Municipal and Corporation Administration – Reservation for Schedule Caste , Schedule Tribes and Women

Books for Refrence

1. Basu, D.D. Introduction to the Constitution of India, LexisNexis Butterworths Wadhwa

   Nagpur, Gurgoan, 2008.

2. Pylee,M.V. India's Constitution, S.Chand & Company, New Delhi, 2005.

3. Johari,J.C. The Constitution of India, Sterling Publishers Pvt Ltd, New Delhi, 2004.

ISLAMIAH COLLEGE (AUTONOMOUS)

M.A.HISTORY VANIYAMBADI

IV SEMESTER

CORE PAPER XIII

HISTORY OF USA FROM 1865 TO 2010 AD

UNIT I

Reconstruction – Rise of Big Business – Rail Roads – Growth of Industry – Labour Movement – Granger and Populist Movement – Growth of Imperialism – The Spanish-American War of 1898

UNIT II

Open Door Policy –Theodore Roosevelt – Progressive Reforms – Foreign Policy – W.H. Taft – Dollar Diplomacy – Woodrow Wilson – New Freedom – USA and the First World War – 14 Points – Treaty of Versailles

UNIT III

Warren Harding – Coolidge Prosperity – Hoover – Great Depression – Franklin D. Roosevelt – New Deal – Good Neighbour Policy – USA and Second World War

UNIT IV

Domestic and Foreign Policy of Harry.S. Truman – Cold War – D. Eisenhower – John. F. Kennedy – Internal Policy – Foreign Policy – Civil Rights Movement – Martin Luther King

UNIT V

Lyndon.B. Johnson – Richard Nixon – Gerald Ford – Jimmy Carter –Ronald Reagan – George Bush – Gulf War and Saddam Husain – End of the Cold War – Bill Clinton – Bush – Barack Obama

Books for Reference

1. Beard and Beard: New basic History of the United States

2. Hill. C.P.: History of the United States, Edward Arnold, London, 1974.

3. Hofstadter: The American Republic, Vol 1, Upto 1865, Prentice – Hall Miller & Arooran. K Engle Wood Cliffs, NewJersey, 1959.

4. Nambi Arooran. K.: History of United States of America (Tamil), TamilNadu Text Book Society, Government of Tamil Nadu, Cehnnai, 1975

5. Parkes, H.B.: The United States of America – A History Khosla Publishing House, Delhi, 1986.

ISLAMIAH COLLEGE [AUTONOMOUS]   **M.A. HISTORY**
VANIYAMBADI   **IV**
SEMESTER
CORE PAPER XIV

HISTORY OF CHINA FROM 1900 TO 2000 AD

UNIT I

China under the Manchus – Boxer Movement – Reforms – Political, Social and Economic Conditions – Fall of Monarchy – Revolution of 1911 – Dr. Sun Yat Sen

UNIT II

Yuan Shi Kal's Presidency – First World War and China – Twenty one Demands –The Paris Peace Conference and China – May Fourth Movement – War Lords – Washington Conference

UNIT III

The Kuomintang – Economic, Social, Intellectual and Cultural Progress of China up to 1931 – The Nationalist Government – Domestic Policies from 1929 to 33 – Chiang-Kal-Shek

UNIT IV

Second Sino-Japanese War – China and the World War II – Growth of Communism – Civil War – Rise of Mao-Tse-Tung – People's Republic of Taiwan

UNIT V

The Establishment of People's Republic of China – Political, Social, Economic Conditions –Cultural Revolution – Deng Ziao – Peng – Reorganization of Communism – 1982 Constitution – Foreign Policy up to 2000 AD

Books for Reference

1. Ahamed, L.L.: History of the Far East in Modern Time, S.Chand 7 Co.Ltd, Ram Nagar, New Delhi-55,1981

2. Clyde and Beers: The Far East, prentice hall of India Pvt Ltd, New Delhi-1, 1977.

3. Chatterji, B.R : Modern China, Meenakshi Prakashan, Begum Bridge, Meerut, 1974.

4. Gupta.R.S. History of Modern China. Sterling Publishers, New Delhi-16, 1974.

5. Latourette, K.S : The Chinese, Their History and Culture.

ISLAMIAH COLLEGE (AUTONOMOUS)   M.A. HISTORY

VANIYAMBADI   IV SEMESTER

CORE PAPER XV

HISTORY OF ENGLAND FROM 1603 TO 1901 AD

UNIT I

Early Stuarts – James I and his relation with Parliament – Charles I – Long Parliament – Policy of Early Stuarts –Civil War

UNIT II

Common Wealth and the Protectorate – Cromwell – Foreign Policy – Constitutional Experiments – The Restoration

UNIT III

Later Stuarts – Charles II – Foreign and Domestic Policy – Origin of the Party System in Britain –James II – Glorious Revolution – William III and Mary – Queen Anne

UNIT IV

The Hanoverian Period – George I and II – Cabinet System under the first two Georges – George III – War of Independence

UNIT V

Revolutionary Era – French, Industrial and Agrarian Revolutions – Humanitarian Movements –George IV – William IV – Victorian Era 1837-1901

Books for Reference:

1. Carter & Mears – History of Britain

2. R.J. White – A Short History of England

3. L.C.B. Seaman – A New History of England

4. David Thomas – England in the 20th Century

ISLAMIAH COLLEGE [AUTONOMOUS]   M.A. HISTORY
VANIYAMBADI   IV SEMESTER
CORE PAPER XVI

HISTORY OF WEST ASIA FROM 1900 TO 2000 AD

UNIT I

Background History of West Asia – Arab Nationalism – First World War and West Asia – Balfour Declaration

UNIT II

Peace Treaties after First World War – British and French Mandates – Birth of Israel – Arab Jewish Conflict

UNIT III

Emergence of Arab Nations after First World War – Syria –Iraq – Jordan – Saudi Arabia – Second World War and West Asia

UNIT IV

Rise of Arab Nations after Second World War – Lebanon – UAR – UAE – Qatar and Bahrain – Yemen – Oman – Kuwait – Gulf War

UNIT V

CENTO – OPEC – PLO – Nixon and Kissinger – Regan Camp David Agreement – Formation of Palestine – Role of UNO in Peace Maintenance

Books for Reference:

1. Majumdar and Srivastava: History of Middle East, Surjeet Publications, Delhi.
2. Kirk. G. E: A Short History of Middle East, Surjeet Publications, Delhi.
3. Fisher Sydney Netland: The Middle East A History, Routledge and Kegan Paul, London.
4. Wilber Domnald N: Iran – Past and Present, Princeton University Press, New Jersey.
5. Leoinard Binder: Iran Political Development in a Changing Society, University of California.

ISLAMIAH COLLEGE (AUTONOMOUS)   M.A. HISTORY
VANIYAMBADI   IV SEMESTER
ELECTIVE IV

GROWTH OF PANCHAYATI RAJ INSTITUTIONS IN INDIA
(WITH SPECIAL REFERENCE TO TAMIL NADU)

UNIT I

Historical Setting – Self-Governing Village System in Ancient India – Vedic Period and Chola Period – Village as an Autonomous Self-Governing Unit in Pre-British Period and Its Decline – Local Self-Governance – Lord Mayo and Lord Rippon – Contribution Of Gandhiji

UNIT II

Balwantarai Mehta Committee Report – Ashok Mehta Committee Report – 73rd Constitutional Amendment Act – Implications of Panchayathi Raj System

UNIT III

Panchayat Raj in Tamilnadu since Independence – Salient Features of Tamil Nadu Panchayat Act 1994

UNIT IV

Powers and Functions: Functionaries and Finance of Village Panchayat, Panchayat Union and District Panchayat

UNIT V

Finance Commission – Election Commission – District Planning Committee – Critical Evaluation of Tamil Nadu Panchayat Act 1994

Books For Reference:

1. G. Palanithurai, Empowering People for Prosperity: A Study In New Panchayati Raj System (New Delhi: Kanishka Publications, 1995).
2. S. Malcom Adhiseshaiyah And Et. Al., Decentralized Planning and Panchayati Raj ((New Delhi: Concept Publishing Company, 1994).

COMMONWEALTH LITERATURE

CORE COURSE IX

SEMESTER III

UNIT – I   POETRY

Australia – Judith Wright   Fire at Murdering Hut

England -   P.K. Page   Adolescence

New Zealand -   The Noosing of the Sun-God

UNIT – II   POETRY

The West Indies - Dereck Walcott   A Far Cry from Africa

Africa – David Rubadiri   A Negro Labourer in Liverpool

Canada- F.R. Scott   The Canadian authors' meet

UNIT – III   PROSE

INDIA – M.K.GANDHI   The Story of My Experiments with Truth

UNIT – 1V   DRAMA

Nigeria – Wole Soyinka   The Lion and the Jewel

UNIT – V   FICTION

Nigeria – Chinua Achebe   Things Fall Apart

Canada- Margaret Atwood   Surfacing

REFERENCES

Margaret J.O'Donnell. An Anthology of Commonwealth Verse, Madras: Blackie.

C.D. Narasimhaiah. An Anthology of Commonwealth Poetry, Madras: Macmillan

LITERARY THEORY AND CRITICISM - I

CORE COURSE X

SEMESTER III

UNIT – I

Introduction to Classical Literary Criticism (Plato, Aristotle and Sydney)

UNIT – II

Johnson   Preface to Shakespeare

Wordsworth   Preface to the Lyrical Ballads

UNIT – III

Arnold   Study of Poetry

T.S.Eliot   Tradition and Individual Talent

UNIT – IV

Literary criticism – Feminism (Showalter)

UNIT – V

N.Frye   Archetypes of Literature

Reference Books:

1. Literary Criticism: Seetharama, Macmillan Publishers. (Unit III & IV)
2. Postmodernism for Beginners (Unit V)

ENGLISH LANGUAGE TEACHING

CORE COURSE XI

SEMESTER III

UNIT-I
English Language Teaching in India

UNIT- II
Psychology of Language Learning
Theories of Language Learning
Cognitive-Code
Behavior theory
First Language acquisition and Second Language learning

UNIT- III
 Methods and Approaches of Teaching English
Translation method – Direct method – Bilingual method – Structure approach – Situational approach – Electic approach

UNIT- IV
 Curriculum Design
Modern concept of curriculum - Curriculum and Education – Need and importance of curriculum – Types of curriculum
UNIT- V
 Audio – visual aid in teaching English
Importance of audio- visual aids – choice of visual aids – chart and tables – flash cards – cue sheets – OHP – slide projector – language laboratory.

REFERENCES
Howall A.P.R. A History of English Language Teaching, OUP, 1984
Richards, J and Rudgers, S. Approaches and Methods in Language Teaching, Cambridge University Press, 2001
David Nunan, Language Teaching Methodology, Prentice Hall, 1991
Dr. S. V. Shrangare. English Language Teaching. Swasthik Publication, Delhi.

CONTEMPORARY LITERARY THEORIES

CORE COURSE XII

SEMESTER III

UNIT – I

Jacques Derrida- Structure, Sign and Play in the Discourse of Human Sciences

UNIT – II

Sigmund Freud: Interpretation of Dreams

Stanley Fish: Is there a text in this Class?

UNIT – III

Stephen Greenblatt: Shakespeare and the Exorcists

UNIT – 1V

Louis Althusser: Ideology and Ideological State Appararuses

UNIT – V-

Elaine Showalter: Towards a Feminist Poetics

Ania Loombaa: Situating Colonial and Post Colonial Studies

John Fiske: Culture, Ideology, Interpellation

REFERENCES

Literary Theory: An Anthology II ed. Julie Rivikin and Michael Ryan. Australia: Blackwell Publishing Ltd. 1998

The English Critical Tradition Vol.1 and 2. Ed. S.Ramasami and V.S.Sethuraman. Macmillan:Chennai 1978

Contemporary Criticism: An Anthology, Ed. V.S. Sethuraman. Macmillan: Chennai 1989

TECHNICAL WRITING

ELECTIVE COURSE III

SEMESTER III

UNIT I

Definition and Concept of Technical Writing

UNIT II

Writing Process – Prewriting, Writing and Rewriting; the Rationale; the Process; Writing Effective Sentences; Structure of a Paragraph; Writing Effective Paragraphs

UNIT III

Instructions and User Manuals; Writing Summaries, Reports and Proposals

Writing different kinds of letters, memos, CV, E-mail communication, Presentation

UNIT IV

Technical Writing Today, Case Studies, Designs and Layout, Computer Skills, Production. **UNIT V**

Practical Exercises for Technical Writing

REFERENCES

Communication Skills for Technical Students. T.M. Farhatullah: Orient Longman, Chennai, 2002

Science and Technical Writing: A Manual of Style. Philip Rubens. Routledge NY, 2004

Writing Remedies: Practical Exercises for Technical Writing. Edmund H Weiss. Hyderabad University Press, 1990

COMPUTER LITERACY

NON MAJOR

SEMESTER III

Unit I

About Windows – My Computer – My documents – Recycle Bin – Wall Paper – Screen Saver - Time and Data – 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

LITERARY THEORY AND CRITICISM – II

CORE COURSE XIII

SEMESTER IV

UNIT – I

Lionel Trilling   Sense of the Past

Cleanth Brooks   The Language of Paradox

UNIT – II

Georg Lukacs   Ideology of Modernism

UNIT – III

Jacques Lacan   Of Structure As An In mixing of an Otherness Prerequisite to

any Subject Whatever

UNIT – IV

Said   From Orientalism- Extract in Modern Criticism And Theory

UNIT – V

Barthes   Death of the Author

Foucault   From Archeology Of Knowledge

Reference Books:

Theory of Criticism: David Lodge

 20th Century Reader: David Lodge

SOFT SKILLS

CORE COURSE XIV

SEMESTER IV

UNIT – I

Communication - Body language, facial expression, humor, eye contact, tone of voice, etiquette

UNIT – II

Empathy **-** Honesty, cultural diversity, ability to take other's point of view, integrating

Cognitive and affective skills

UNIT – III

Intrapersonal **-** Self-management, self-esteem, self-awareness, self-regulation, self-critique

UNIT-IV

Interpersonal - Team work, persuasion, negotiation, conflict resolution, Reading social situations, learning to say no, active listening

UNIT – V

Leadership - Critical, lateral, strategic thinking, delegation, taking responsibility, giving praise, appreciation, giving and receiving feedback, ability to motivate, problem solving.

REFERENCES

Working with Emotional Intelligence. Daniel Coleman.

How to Develop Self Confidence and Influence People by Public Speaking. Dale Carnegie.

[Unit I- Body Language: Alan Pease]

JOURNALISM AND MASS COMMUNICATION

CORE COURSE XV

SEMESTER IV

UNIT-I

Introduction to Journalism and Mass Communication - Growth of Journalism and its impact on society - Radio Journalism - T.V journalism- Growth, Impact, Merits and Demerits

UNIT-2

Introduction to Journalism and Mass Communication - Print Journalism - Role of Cinema as a Mass Medium - Investigative Journalism

UNIT-3

Newspaper Organization - Reporting: Ethics of Good Reporting, T.V. Reporting, Radio Reporting etc. - Feature Writing: Economic, Politics, Sports etc. -Editing, Organization and Presentation - Presenting Book Reviews

UNIT-4

Aspects of communicative Studies - Definition of Communicative Studies - Communicative Terms and Principles- Communicative Purpose and Setting

UNIT-5

Communicative Skills – Skimming – Scanning – Referencing – Coding – Decoding - Transcoding - Advertising

REFERENCE BOOKS

Mass Communication and Journalism in India. D.S. Mehta

Theory and Practice of Journalism. B.M.Ahuja

News Reporting and Editing-K.M. Shrivastava : Sterling Publishers. Bangalore 1987.

WOMEN'S WRITING IN ENGLISH

CORE COURSE XVI

SEMESTER IV

UNIT I   POETRY

Elizabeth Barret Browning: A Dead Rose

Sylvia Plath: Blackberrying

Maya Angelou: I Know Why The Caged Bird Sings

Kamala Das: An Introduction

UNIT II   PROSE

Virginia Woolf: A Room of One's Own

Arundhathi Roy: How deep shall we dig?

UNIT III   DRAMA

Maha Sweta Devi: Mother of 1084

Caryll Churchill: Serious Money

UNIT IV   FICTION

Jhumpa Lahiri: The Namesake

Margaret Atwood: The Handmaid's Tale

UNIT V   GENERAL

Mary Wollstone Craft: A vindication of the Rights of women

Elaine Showalter: A literature of their own

M.A ENGLISH
SEMESTER IV
ELECTIVE PAPER V
ANATOMY OF LITERATURE

UNIT-I : THE ANATOMY OF PROSE

The form of prose - vocabulary - grammar and idiom written and spoken prose - the paragraph - prose rhythm - individual and common style - common style and cheap style - simplicity and ornamentation - objective and subjective - abstract and concrete - realism, romance and unreality - special inventions - prose for its own sake - the historical approach - the science of rhetoric - writing prose

UNIT-II : THE ANATOMY OF POETRY

The importance of form - the physical form of poetry - metre - variation - rhyme - onomatopoeia - internal pattern - form in intonation - repetition - the main types of poetry - logical sequence - the use of associations - patterns of imagery - traditional verse forms - free verse - the choice of words - illustrations - cautions - twentieth - century techniques.

UNIT-III : THE ANATOMY OF NOVEL

The concept of fiction - verisimilitude - the point of view - plot - character - character revealed - conversation - scene and background - dominant themes - the experimental novel

UNIT-IV : THE ANATOMY OF DRAMA

Live literature - action - plots - conventional divisions - direct experience of characters - dialogue and conversation - verse and prose - types of drama - drama and history - use of notes - interpretation

UNIT-V : LITERARY RESEARCH

Research and writing - the mechanics of writing - the format of the research paper - documentation: preparing the list of works cited - documentation: citing sources in the text - abbreviations

Reference
Marjorie Boulton, The Anatomy of Prose (1954)
Marjorie Boulton, The Anatomy of Poetry (1953)
Marjorie Boulton, The Anatomy of Novel
Marjorie Boulton, The Anatomy of Drama (1960)
Joseph Gibaldi, MLA Handbook for Writers of Research Papers, 6th Ed

M.Phil. BIOTECHNOLOGY

Core –I :: Advanced Biotechnology

(75+25 = 100 Marks)

Unit I:Plant Biotechnology

In-vitro regeneration protocols amenable for gene transfer, Vectors used in gene transfer in plants. Ti plasmids, Biolistic gun. Antisense and RNAi strategies for metaboloic engineering .Transgenic crops for herbicide ,pest and abiotic stress resistance. Terminator gene technology. Biosafety issues, IPR and Bioethics.

Unit – II:Animal Biotechnology

Different cell culture techniques ; Development of cell lines; Characterization and maintenance of cell lines; cryopreservation, Cell cloning and selection; transfection and transformation of cells; Application of animal cell culture for in vitro testing of drugs; Applications of cell culture technology in production of human and animal viral vaccines. Transgenic animal models: gene knock-outs; Cre-lox systems-applications.

Unit – III:Medical Biotechnology

Human health care, genetic disorder, gene therapy, Infectious diseases, DNA-based disease diagnosis, Stem cell biology: stem cell types- haematopoietic and embryonic-chord blood cells- regenerative medicines. Production of Bioactive Compounds, Drug delivery, Development of recombinant vaccines, Herbal medicine.

Unit – IV: Industrial Biotechnology

Production of enzymes & organic acids, Downstream processing, Solid state fermentation, Bioprocess monitoring, modeling and control, Biocatalysis & Biotransformation, Bioconversion of biomass, Biosensors, Biofuel- bioethanol and biohydrogen, Biopolymers. Principles and applications of Nanobiotechnology.

Unit – V:Environmental Biotechnology

Global environmental issues and biotechnological solutions. Treatment of industrial effluents- solid waste management- Management of nuclear waste. Bioremediation- *in situ* and *ex situ* bioremediation. Biodegradation of xenobiotics. Biomonitoring . Biodiversity conservation.

REFERENCES:

1. Sathyanarayana. (2010). Biotechnology, India.

2. Slater,A. Scot,N. and Fowler,M. (2007) Plant Biotechnology-the genetic manipulation of plants. Oxford press,

3. Watson,J.D; Gilman,M; Witkowshi,J and M.Zoller, 1992. Recombinant DNA, 2nd edition. Scientific American Books, W.H. Freeman and Co; New york, USA

4. Glick, B.R and J.J. Pasternak. 2005. Molecular Biotechnology- Principles and application of recombinant DNA, 3rd edition. ASM press. Washington, USA

5. Environmental Biotechnology, principles and applications, Bruce Rittman, Perry Mccarty, McGraw- Hill, 2nd edition, 2000.

6. Therapeutic Immunology, K. Frank Austen, Steven J. Burakoff, Fred.S.Rosen, Terry.B.Storm (2nd edition) 2001.

RESEARCH METHODOLOGY

UNIT- 1 RESEARCH METHODOLOGY

Meaning of research-Objectives of research-motivation of research- Types, approaches and significance-Methods versus methodology- Research in scientific methods-research process- Criteria for good research- Problem encountered by research in India – Funding agencies.

UNIT - 2 RESEARCH DESIGN

Research problem: Selecting the problem – Necessity of defining the problem – Techniques involved in defining the problem – Research designs- Needs and features of good design – Different research design – Basic principles of experimental designs.

UNIT- 3 DATA COLLECTION AND DOCUMENTATION

Data collection methods – Data types- Processing and presenting of data- Techniques of ordering data- Meaning of primary and secondary data- The uses of computers in research- The library and internet – uses of search engines – virtual libraries-common software for documentation and presentation.

UNIT-4 DATA AND ERROR ANALYSIS

Statistical analysis of data-Standard deviation-Correlation-comparison of sets of data-Chi square analysis of data-Characteristics of probability distribution-Binomial, Poisson and normal distribution- Principle of least square fittings- Curve fitting-Measurement of Errors – Types and source of errors- Determination and control of errors.

UNIT- 5 RESEARCH COMMUNICATION

Meaning of research report- logical format for writing thesis and paper – Essential of scientific report- Abstract, Introduction, Review of literature. Materials and methods and discussion- Write up steps in drafting report- Effective illustrations ; Tables and figures - Reference styles; Harvard and Vancouver systems.

REFERENCE BOOKS:

1. Research methodology, Methods and techniques- C.R.Kothari - Vishwapragasam publications,2nd edition.
2. Research ; An introduction - Robert Ross – Harper and Row publications
3. Research methodology – P.Saravanavel – Kitlab mahal, 6th edition.
4. A hand book of methodology of research- Rajmmal P.A.Devadas- Vidhalaya press.
5. Introduction to computers – N.Subramanian
6. Statistical methods – G.W.Snedecor and W.Chcharan – Oxford and   IBH, New delhi.
7. Research methodology methods and statistical techniques – Santhosh gupta.
8. Statistical methods – S.P.Gupta.
9. Scientific social survey and research – P.young – Asia publisher, Bombay
10. How to write and publish a scientific paper – R.A.Day, Cambridge University press.
11. Thesis and assignment writing- Anderson- Wiley Eastern Limited.

Special Paper / Guide paper: ENDOCRINE BIOTECHNOLOGY

Unit I:
Endocrinology- definition- scope and importance. peptide and steroid hormones types. Mechanisms of peptide and steroid hormone actions-positive and negative feed backs.

Unit – II:
Pituitary gland anterior- arterior pituitary-adeno hypophysis- ACTH,GH,PRL,TSH,LH,FSH.
Posterior pituitary-neuro hypothesis- Antidieuretic hormone (ADH),Oxytocin. Pathophysiology of pituitary – hypo pituitarism. Pituitary adenoma, gigantism, Acromegaly, Dwarfism, hypogonadism.

Unit – III:
Thyroid gland- throid hormone synthesis, secretion and functions. Hypothyroidism and hyper thyroidism, thyroid cancer. Para thyroid hormone(PTH) and calcitonin their role in bone metabolism. Adrenal gland, glucocorticoids and biological effects. Adrenal medullary hormone- hypo and hyper function of adrenal cortex and medulla.

Unit – IV:
Pancreas- Insulin and diabetes mellitus, treatment. Testis: spermatogenesis and male gonad disorders, Ovary- ovarian cycle and ovarian disorders. Endocrinology of pregnancy and contraception.

Unit – V:
Hormones and cancer: Steroid dependent cancer, uterine, endometrial breast cancer in women. Endocrine autoimmune disease. Endocrine therapy for cancer.

Unit 1. Principles of aquaculture and Aqua farm engineering

Definition, history and scope of aquaculture, constraints and recent advances in aquaculture, criteria for selection of species. Design and construction of aqua – hatcheries, aeration in aquaculture types and design, equipments, automatic feeders Heaters ,Thermostats,Filters-Under gravel, power filter.

Unit 2. Fish breeding

Induced breeding, hypophysation, different ovulating agents, hatchery and bundh
breeding, multiple breeding, natural collection of seed, live transportation of brood
fish and seed.

Unit 3. Feed formulation and Live food culture technology

Types of feeds, feed ingredients and their selection, formulation and preparation of feed, , feed attractants and preservatives. Natural food and their importance. Methods of collection, maintenance and rearing of fish food organisms

Unit 4. Disease diagnosis and Parasitic diseases

Principles of disease diagnosis in fish .Clinical diagnosis, histopathological and haematological methods. Diseases caused by bacteria, fungi and viruses, their prophylactic and therapeutic measures.

Unit 5. Ornamental fish

Aquarium ornamental fishes, their breeding and culture,-Guppy Molly,Gold fish Fighter, Angel and Morph. Common aquarium plants and their multiplication.
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Reference Books:

4. Encyclopedia of Ornamental fishes. Herbert Axel rod – T.F.H. pub. NewJercy. (1992)
5. Hand Book of aquarium fishes. Dr.Schultz and H.Axel rod. (1980)
6. Fish and fisheries of India by Jhingran (2000).

Special Paper / Guide paper : ENVIRONMENTAL BIOTECHNOLOGY

UNIT 1

Environment – basic concepts and issues, global environmental problems – ozone depletion, global warming, greenhouse effects and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management.

UNIT 2

An overview of atmosphere, hydrosphere, lithosphere and anthrosphere – environmental problems.

Environmental pollution – types of pollution, source of pollution, measurements of pollution, methods of measurement of plooution, fate of pollutants in the environment.

UNIT 3

Microbiology of waste water treatment, aerobic process - activated sludge, oxidation ponds, trickling filter, oxidation ditch. Anaerobic process – anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatnment schemes for waste of dairy, distillery, tannery, sugar and antibiotic industries

UNIT 4

Xenobiotic compounds – organic[chlorinated hydrocarbons, substituted simple aromatic compounds, polyaromatic hydrocarbons, pesticides, surfactants] and inorganic[metals, radionuclides, phosphates, nitrates].Bioremediation of xenobioticsin environment – ecological consideration, decay behavior and degradative plasmids, molecular techniques in bioremediation.

UNIT 5

Role of immobilized cells/enzymes in treatment of toxic compounds. Biopesticides, bioreactors, bioleaching, biomining, biosensors, biotechniques for air pollution abatement and odour control.

Special Paper / Guide paper: HERBAL BIOTECHNOLOGY

Unit 1
Principles and Medicinal Plants in Indigenous Systems: Institutionalized - Ayurveda, Siddha, Unani and Homeopahty. Non-institutionalized – Ethnomedicine

Unit 2
Drugs Developed from traditional medicines. Traditional medicines under trial for developing drugs. The role of ethnobotany in relation to drug discovery in India. Plants in folklore with special reference to South India.

Unit 3
Collection and processing of herbal drugs. Seasonal & geographical variations; natural & artificial drying methods. Packaging & labeling of herbal drugs prior to extraction.

Unit 4
Disease & Control:Callus and protoplast culture, cell line selection and mass culture. Hormones, Important plant hormones.

Unit 5
Brioprospecting and equitable compensation and Biopiracy. Intellectual Property in Drug Discovery and Biotechnology: Patent protection and strategy

References
Banthrope, D.V. and Charlwood, B.V. 1980. The Terpenoids. In: Bell, E.A., and Charlwood, B.V.

Secondary Plant Products. (Encyclop. Plant Physiology, Vol. 8). Springer Verlag, Berlin.

Busse, W. D. and Ganellin, C. R. 1993. Views from Industry on the Medicinal Chemistry Curriculum: Answers to a Questionnaire. In Trends in Drug Research, (Ed.) V. Claassen, Pharmacochemistry Library, 20, Elsevier, Amsterdam.

Harborne, J. B. and Baxter, H. 1993. Phytochemical dictionary - a handbook of bioactive compounds from plants. Taylor and Francis Limited, London.

Hiatt, A. 2001. Transgenic plants: fundamentals and applications. Marcel Dekker Incorporated, New York.

Hopkins, S. J. 1992. Principal drugs, 10th Edn. Mosby Year Book Europe Limited, London.

Khan, I. A. and Khanum, A. 1999. Role of Biotechnology in Medicinal and Aromatic Plants, Vol. II. Ukaaz Publications, Hyderabad, India.

MASTER OF PHILOSOPHY

COMPUTER SCIENCE

(FT/PT) [With effect from 2013-2014]

PAPER-I

CORE COURSE I

RESEARCH METHODOLOGY

UNIT I - Research Methodology
Meaning of Research - Objectives of research – motivation of research – Types, approaches and significance – Methods versus Methodology – Research in Scientific methods – Research process – Criteria for good research – Problem encountered by research in India – Funding agencies/

UNIT II - Research Design
Research problems – Selecting the problem – Necessity of defining the problem – Techniques involved in defining the problem – Research design – Needs and features of good design – Different research design – Basic principles of experimental designs.

UNIT III – Data Collection and Documentation
Data collection methods – Data types – Processing and presentation of data – Techniques of ordering data – Meaning of primary and secondary data – The uses of computers in research – The library and internet – Uses of search engines – virtual libraries - common software for documentation and presentation

UNIT IV – Data and Error analysis
Statistical analysis of data – Standard deviation – Correlation – Comparison of sets of data – Chi square analysis of data – Characteristics of Probability distribution – Binomial, Poisson and normal distribution - principles of least square fittings – Curve fitting – Measurement of errors – Types and sources of errors – Determination and control of errors.

UNIT V – Research Communication
Meaning of research report – logical format for writing thesis and paper – Essential of scientific report – Abstract, Introduction , Review of literature , Materials and Methods and discussion. Write up steps in drafing report – Effective illustrations : Tables and figures – Reference styles : Harvard and Vancouver Systems.

Reference Books

1. Research methodology , Methods and techniques – C.R. Kothari – Viswapragasam Publications, 2nd Edition.
2. Research : An Introduction – Robert Ross – Harper and Row Publications.
3. Research methodology – P. Saravanavel – Kitab Mahal, 6th edition.
4. A handbook of methodology of Research – Rajammal P.A. Devadas – Vidhalaya press

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6. Statistical Methods – G.W. Snedecor and W. Cocharan – Oxford and IBH, New Delhi
7. Research methodology methods and statistical techniques – Santhosh gupta.
8. Statistical Methods – S.P. Gupta
9. Scientific social survey and research - P. Young – Asia publisher, Bombay.
10. How to write and publish a scientific paper – R. A. Day, Cambridge University Press.
11. Thesis and assignment writing – Anderson – Wiley Eastern Limited

MASTER OF PHILOSOPHY
COMPUTER SCIENCE
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PAPER-II
CORE COURSE II

COMPUTER GRAPHICS AND IMAGE PROCESSING
UNIT I
Scan conversion – lines, circles and Ellipses; Filling polygons and clipping algorithms:Scan Converting Lines, Mid-point criteria, Problems of Aliasing, end-point ordering and clipping lines, Scan Converting Circles, Scan Converting Ellipses, Filling Polygons, edge data structure, Clipping Lines algorithms– Cyrus-Beck, Cohen-Sutherland and Liang-Barsky.

UNIT II
Visible-Surface Determination:Techniques for efficient Visible-Surface Algorithms, Categories of algorithms, Back face removal, The z-Buffer Algorithm, Scan-line method, Painter's algorithms (depth sorting)
Illumination and Shading:Illumination and Shading Models for Polygons, Reflectance properties of surfaces, Ambient, Specular and Diffuse reflections, Atmospheric attenutation, Phong's model, Gouraud shading.

UNIT III
Image Enhancement and Image Restoration
Image Enhancement in the Spatial Domain: Basic Gray Level Transformations, Histogram
Processing, Enhancement Using Arithmetic/Logic Operations, SpatialFiltering , Fuzzy sets for
spatial filters – Image Enhancement in the Frequency Domain: Frequency Domain Filters - Image
Restoration: Model of Image Degradation/Restoration Process, Noise Models, Linear and non linear
image restoration techniques, Blind Deconvolution

UNIT IV
Multiresolution analysis and Image Compression
Multi Resolution Analysis: Image Pyramids – Multi resolution expansion – Fast Wavelet Transforms,

Lifting scheme. Image Compression: Fundamentals – Models – Elements of
Information Theory –
Error Free Compression – Lossy Compression-wavelet based image compression
techniques –
Compression standards-JPEG/MPEG, Video compression.

UNIT V
Image Segmentation and Description
Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary
Detection,
Thresholding, Region Based Segmentation, Basic Morphological Algorithms,
Morphological Water
Sheds - Description: Boundary Descriptors, Regional Descriptors.

REFERENCES:
1. J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes, Computer Graphics -
Principles and Practice, Second Edition in C, Pearson Education, 2003.
2. D. Hearn and M. Pauline Baker, Computer Graphics (C Version), Pearson Education,
2nd Edition, 2004.
3. D. F. Rogers and J. A. Adams, Mathematical Elements for Computer Graphics, 2nd
Edition, McGraw-Hill International Edition, 1990.
4. Rafael C.Gonzalez and Richard E.Woods, "Digital Image Processing", Pearson
Education, Third
Edition, 2008.
5. Anil K.Jain, "Fundamentals of Digital Image Processing", PHI, 2006.
6. Rafael C.Gonzalez, Richard E.Woods, and Eddins, "Digital Image Processing Using
MATLAB",
Tata McGraw-Hill, Second Edition, 2009.