M.Sc. CHEMISTRY FIRST SEMESTER			
COURSE CODE: MSC 101		**COURSE TYPE: CCC**	
COURSE TITLE: **INORGANIC CHEMISTRY-1**			
CREDIT: **THEORY: 6**	**PRACTICAL:**	**HOURS:** **THEORY: 90**	**PRACTICAL: 00**
MARKS: **THEORY: 70+30**	**PRACTICAL:**	**MARKS** **THEORY:**	**PRACTICAL:**

OBJECTIVE:

To study the concept of coordination Chemistry, stability of the complexes and stereochemistry of complexes. To study about structure and bonding.

UNIT-1 22 Hours

STEREOCHEMISTRY AND BONDING IN MAIN GROUP COMPOUNDS,QUANTUM MECHANICS

VSEPR, Walsh Diagram (Tri and Penta atomic molecules), dribonds. Bent rule and energetic of hybridization. Some simple reactions of covalently bonded molecules.

Metal ligand Equilibria in Solution-Stepwise and overall formation constants and their interaction, trends in step-wise formation constants, factors affecting the stability of metal complexes with reference to nature of metal ion ligand, chelate effect and it's thermodynamic origin, model of chemical bonding-molecular orbital(MO), Valency bond theries, application to diatomic molecule such as H2,H2+, etc.quantitative MO theory-Huckel-electron theory and its application to ethelene ,butadiene and benzene.

UNIT-2 22 Hours

REACTION MECHANISM OF TRANSITION METAL COMPLEXES

Energy profile of a reaction, reactivity of metal complexes, inert and labile complexes, kinetic application of valence bond and crystal field theories, Kinetic s of octahedral substitution, acid hydrolysis, Base hydrolysis, factors affecting acid hydrolysis, conjugate base mechanism, direct , substitution reactions without metal ligand cleavage, substitution reaction in square planar complexes, the trans effect, mechanism of substitution reaction, Redox reactions, electron transfer reactions, Mechanism of one electron transfer reaction in octahedral, outer sphere type reactions, cross reactions and Marcus- Hush Theory, inner sphere type reactions.

UNIT-3 22 Hours

CHEMICAL BONDING:LCAO-MO theory, metallic bonding, band theory, hydrogen bonding, ,

METAL LIGAND BONDING

VBT, Crystal field theory and application, Limitation of Crystal Field Theory, molecular orbital theory ,tetrahedral, octahedral, and square planar complexes,

UNIT-4 22 Hours

METAL COMPLEXES

Metal carbonyls, structure and bonding, vibrational spectra of metal carbonyls for bonding and structural elucidation, important reactions of metal carbonyls, nitrosyls- preparation, bonding and structure and important reactions of transition metal nitrosyl, dinitrogen and dioxygen complexes, tertiary phospine as ligand.

UNIT-5 22 Hours

(A) CROWN ETHER COMPLEXES NAD CRYPTANDS, INCLUSION COMPOUND
(B) ISOPOLY AND HETROPOLY ACIDA AND SALTS.;

(C) INORGANIC POLYMERS: Preparation, structure and its application of Phosphazines ,borazine , silicones,

SUGGESTED READING BOOKS

1. J.E. Huheey, Inorganic Chemistry - Principles, Structure and Reactivity, Harper Collins, New York, IV Edition (1993)
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry - A Comprehensive Text, John Wiley and Sons, V Edition (1988)
3. K.F. Purcell and J.C. Kotz, Inorganic Chemistry - WB Saunders Co., USA (1977)
4. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974)
5. J.E. Huheey, Inorganic Chemistry, Harper Collins NY IV Edition, (1993)
6. G.S. Manku, Inorganic Chemistry (1984)

M.Sc. CHEMISTRY FIRST SEMESTER

COURSE CODE: MSC 102	**COURSE TYPE: CCC**
COURSE TITLE: **ORGANIC CHEMISTRY-I**	
CREDIT: **THEORY: 6 PRACTICAL:**	**HOURS:** **THEORY: 90 PRACTICAL:00**
MARKS: **THEORY: PRACTICAL:** **70+30**	**MARKS** **THEORY: PRACTICAL:**

OBJECTIVE:

To learn the concepts of stereochemistry, conformational analysis and their application in the determination of reaction mechanism. To understand the nucleophilic and electrophilic substitution.

UNIT-1 20 Hours

STEREOCHEMISTRY:

Optical activity and chirality, enatiomers, diastereoisomers , Classification of chiral molecules as asymmetric and dissymmetric. A brief Study of dissymmetry of allenes, biphenyls, spiro compounds, R, S notation of biphenyls and allenes. Fischer projection. Inter conversion of Sawhorse, Newman and Fischer projections. Molecules with more than one asymmetric center (restricted to five carbons). e.g. Erythro and threo compounds. Asymmetric synthesis, Cram's rule.

Geometrical isomerism: E, Z - nomenclature of olefins, . Stereo specific and stereo selective reactions.

CONFORMATIONAL ANALYSIS :

Conformation of 1, 2 disubstituted cyclohexane and their stereo chemical features (geometric and optical isomerism). Conformation and reactivity of substituted cyclohexanol (oxidation and acylation), cyclohexanone. (reduction) and cycloehexane carboxylic acid derivatives (esterification and hydrolysis). Conformation and stereochemistry of cis and trans decalin and 9 - methyldecalin

UNIT-2 18 Hours

REACTION INTERMEDIATES: Introduction ,generation ,structure,,stability and reaction of carbocation,,carboanion,free radical, carbenes ,nitrenes,and benzynes.

.

ELIMINATION REACTION: Introduction,E1 and E2 reaction mechanism, pyrolytic syn elimination reaction,dehydration of alcohals.dehalogenation of vicinal dihalides,Peterson reaction.

UNIT-3 19 Hours

ALIPHATIC NUCLEOPHILIC SUBSTITUTION REACTION

SN1, SN2 and SNi mechanisms,SET mechanism - Neighboring group participation - reactivity, structural and solvent effects - substitution in norbornyl and bridgehead systems - nucleophilic substitution at allylic and vinylic carbons ,phase transfer catalyst,resioselectivity, ambident nucleophiles , - alkylation and acylation of amines, Von-Braun reaction, alkylation and acylation of active methylene carbon compounds, Esterification and ester hydrolysis mechanims, Claisen and Dieckmann condensation.

ALIPHATIC ELECTROPHILIC SUBSTITUTION:

SE1, SE2 and SEi mechanism, double bond shift - Reactivity. Migration of double bond, keto-enol interconversion, HVZ reaction, Stark-Enamine reaction, halogenation of aldehydes and ketones .

UNIT-4 17 Hours

AROMATIC ELECTROPHILIC SUBSTITUTION REACTIONS

The arenium ion mechanism. Orientation and reactivity of ortho/para and meta directing group, IPSO attack. Typical reactions - nitration, sulphonation, halogenation, Friedal Crafts alkylation and acylation reaction and, Formylation reaction-,Reimer - Tieman reaction, Vilsmeyer - Hack, Gattermann, Gattermann - Koch ,. Fries rearrangment , Electrophilic susbstitution of furan, pyrole, thiophene and pyridine-N-oxide.

UNIT-5 16 Hours

AROMATIC NUCLEOPHLILIC SUBSTITUTIONS AND DETERMINATION OF REACTION MECHANISM

Methods for the generation of benzyne intermediate and reactions of aryne intermediate. Nucleophilic substitution involving diazonium ions. Aromatic Nucleophilic substitution of activated halides. Ziegler alkylaiton. Chichibabin reaction, ArSN1 and ArSN2 reaction. Von Richter rearrangement, Sommlet-Hauser rearrangement, Smiles rearrangement.

Kinetic and non-kinetic methods of determining organic reaction mechanism:The rate determining steps, intermediate and transision state, thermodynamics and kinetics control, isotopes effect,

Hammett and Taft equations - Simple Problems.

SUGGESTED READING BOOKS

1. Organic Synthesis by R.O.C. Norman, Chapman and Hall, NY, (1980)
2. Physical Organic Chemistry by Niel Isaacs, ELBS Publications (1987)
3. Organic Reaction Mechanism by S.M. Mukherji and S.P. Singh, MacMillan India Ltd., Chennai (1990)
4. Organic Chemistry IV Edition by Stanley Pines
5. Structures and Mechanism by E.S. Gould
6. Advanced Organic Chemistry, Part A and B, by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990), Plenum Press.
7. Aromatic Nucleophilic Substitution by J. Miller
8. Advanced Organic Chemistry III Edition by J. Miller
9. Reactive Molecules, C. Wentrup, John Wiley and Sons, New York (1984)
10. Advanced organic reaction mechanism and structure by J. March, Tata McGraw Hill.
11. Organic Chemistry, Marc London
12. Organic Chemistry, Mc Murray
13. Organic Chemistry, Graham Solomons
14. Carbenes, Nitrenes and Arynes by T.L. Gilchrist and C.W. Rees, Thomas Nelson and Sons Ltd., London.
15. Stereochemistry, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai.
16. Stereochemistry of carbon compounds by Ernest Eliel
17. Stereochemistry and Mechanism through solved problems by P.S. Kalsi. Wiley Eastern Ltd., (1994)
18. Basic principles of Organic Stereochemistry by P. Ramesh - Madurai Kamaraj University.
19. Organic Reaction Mechanism by R.K. Bansal.
20. A Guide book to mechanism in organic chemistry by Longman.
21. Structure and mechanism in organic chemistry by C.K. Ingold, cornell University press.

M.Sc. CHEMISTRY FIRST SEMESTER			
COURSE CODE: MSC 103		**COURSE TYPE: CCC**	
COURSE TITLE: **ANALYTICAL CHEMISTRY**			
CREDIT: **THEORY: 6**	**PRACTICAL:**	**HOURS:** **THEORY: 90**	**PRACTICAL: 00**
MARKS: **THEORY: 70+30**	**PRACTICAL:**	**MARKS** **THEORY:**	**PRACTICAL:**

OBJECTIVE: to learn about the chemical analysis, solvent extraction,separation technique and spectroscopic technique.

UNIT-1 18Hours

Fundamentals of Chemical Analysis:
Quantitative and Qualitative analysis; Error, types of errors, minimization of errors, statistical method of error analysis, Sensitivity and Selectivity of Analytical methods; Sampling; Accuracy & precision; Standard Deviation; Calibration curve and Correlation Coefficient; linear regression;, student 't' test, Analysis of Variance (ANOVA).

UNIT-2 18 Hours

Solvent extraction And organic reagents:
Quantitative and Qualitative treatment of solvent extraction; Organic reagents dithiols, diketones, oxine, dithizone, cuproin, cupferron, dimethylglyoxime and dithiocarbamates in solvent extraction; Synergistic Extraction: determination of Nickel; Crown ethers for ion association complexes.

UNIT-3 18 Hours

Ion Exchange technique :Basic features of ion exchange reactions; Ion exchange resins and their classification; action of ion exchange resins; Factors affecting the selectivity of ion exchange resin; Ion Exchange capacity, Ion selective Electrodes. Ion Exchange Chromatography

UNIT-4 18 Hours

Separation Techniques: Principle, methodology and applications: Super Critical Fluid Chromatography, , Gel Filtrations and Gel Permeation Techniques; Electrophoresis,
TLC Chromatography-introduction, principle, technique,solvent system, plate development, detection of components, application and limitation.
Column chromatography- principle,experimental details,theory of development ,column efficiency ,factor affecting column efficiency.

UNIT-5 18 Hours

Spectroscopic Techniques:
Principle, General layout of instrument and applications of: Flame Photometry;Atomic Absorption Spectroscopy (AAS); Fluorescence Spectroscopy; Nephelometry&Turbidometry.

1. Vogel's Textbook of Quantitative Chemical Analysis, G.H.Jeffery, J.Bassett, J. Mendham and R.C. Denney, Publ ELBS, Longman, UK
2. Basic Concepts of Analytical Chemistry, S. M. Khopkar, Wiely Eastern.
3. Fundamentals of Analytical Chemistry, D.A. Skoog, D.M. West and F.J.Holler. Publ. W B Saunders.
4. Analytical Chemistry, G.D. Christian, John Willy & Sons.

M.Sc. CHEMISTRY FIRST SEMESTER

COURSE CODE: MSC 111 **COURSE TYPE: CCC**

COURSE TITLE:
INORGANIC AND ANALYTICAL CHEMISTRY LAB

CREDIT: **THEORY: 00 PRACTICAL:06**	**HOURS:** **THEORY: 00 PRACTICAL:135**
MARKS: **THEORY: PRACTICAL:**	**MARKS** **THEORY: PRACTICAL:**

OBJECTIVE: To learn and practical experience of different quantitative and qualitative analysis.

	Semimicro qualitative analysis of mixture containing eight radicals including two common and two rare cations. The following are the rare cations to be included. W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo, Be. Quantitative Analysis involving two of the following in ores, alloys, mixtures in solution : one by volumetric and other by gravimetric method Ag, Cu, Fe, Cr, Mn, Ni, Zn, Ba, Ca
	a) Complexometric titrations (EDTA) - Estimation of Ca, Mg and Zn. b) Preparation of the following: (i) Potassium tris (oxalate) aluminate (III) trihydrate (ii) Tris (thiourea) copper (I) sulphate (iii) Potassium tris (oxalaato) chromate (III) trihydrate (iv) Sodium bi (thioshophato) cuprate (I) (v) Bis (dimethylglyoximeato) nicke (II) (vi) Sodium hexanitrocobaltate (iII) (vii) Chloropentammine cobalt (III) chloride (viii) Bis (acetylacetanato) copper (II) (ix) Hexanrinennickel (II) chloride (x) Bis (thicyanato) pyridine manganese (II) c) Separation of zinc and magnesium on an anion exchange
	Volumetric and Gravimetric Analysis Determination of iodine and saponification values of oil sample. Determination of DO, COD, BOD, Hardness of water sample. Determination of metal ions e.g. Ni, Cu, etc. by gravimetric methods using organic precipitants such as dimethylglyoxime, dithizone, etc.
	Chromatography: Separation of anions and cations by paper chromatography pH meter and potentiometer : Determination of strength of solutions Flame photometry/ Colorimetry : Determination of cations/anions and metal ions Spectrophotometry : Verification of Beer-Lambert's law, Molar absorbity calculation. Plotting graph to obtain λ_{max} Nephelometry/Turbiditymetry : Determination of chlorides, phospates turbity etc. Estimation of aminiacid using ninhydrin method, Estimation of carbohydrate by spectrophotometric method.

M.Sc. CHEMISTRY FIRST SEMESTER	
COURSE CODE: MSCA01	**COURSE TYPE: ECC/CB**
COURSE TITLE:CONSTITUTIONALISM & INDIAN POLITICAL SYSTEM	
CREDIT: 06 **THEORY: 06**	**HOURS : 90** **THEORY: 90**
MARKS : 100 **THEORY: 70 CCA : 30**	

OBJECTIVE:

- Understands the concept of Constitutionalism
- Gets acquainted with various Indian Political System
- Becomes familiar with various Union Executive
- Gets conversant with Legislatures, Legislative Bills
- Achieves skills in various writings

UNIT-1 12 Hours

Meaning: Constitution, Constitutional government & constitutionalism; Difference between Constitution & Constitutionalism; Constitutionalism: Basis, Elements, Features & future. Forms of Government: Democracy & Dictatorship, Unitary & Federal, Parliamentary & Presidential form. Ideals of the Indian Constitution incorporated in the Preamble.
Special Features of the Indian Constitution.

UNIT-2 24 Hours

Concept of State and Citizenship, Judicial Review and Fundamental Rights, Directive Principles of the State Policy, Fundamental Duties, Procedure to Amend the Indian Constitution, Judiciary: Supreme Court and High Court, Judicial Activism and Public Interest Litigation and Provisions relating to Emergency.

UNIT-3 10 Hours

Union Executive- President, Prime Minister, Council of Ministers. State Executive- Governor, Chief Minister and Council of Ministers. Local Bodies &Panchayati Raj

UNIT-4 24 Hours

Parliament of India, State Legislatures, Legislative Bills: Ordinary, Money and Financial, Union State Relations, Principles of the 'Separation of Power and the 'Principles of Check & Balance'.
Political Parties and Pressure Groups.
Challenges before Indian Democracy: Terrorism, Regionalism, Communalism, *Linguistics* and National Integration.

UNIT-5 20 Hours

Controller & Accountant General of India, Solicitor General, Advocate General, Election Commission, Union and State(s) Public Service Commission, Finance Commission.

HOBBES, Thomas, The Leviathan, Chapters XIII & XVII [entry]

LOCKE, John, The Second Treatise of Civil Government, Chapter IX [entry]

ROUSSEAU, Jean-Jacques, The Social Contract or Principles of Political Right

MONTESQUIEU, The spirit of the laws,

RAZ, Joseph, "The rule of law and its virtue", in The authority of law, Oxford University Press, 1979

Dicey on British constitution

P. Ishwara Bhat Inter-relationship between Fundamental Rights

M P Jain Indian Constitutional Law

H M Seervai Constitutional Law of India

V N Shukla Constitution of India

D DBasu Shorter Constitution of India

B Sivarao Constitutional Assembly Debates

J. V R Krishna Iyer Fundamental Rights and Directive Principles

Paras Diwan Human Rights and the Law

P K Tripathi Some Insight into Fundamental Rights

S P Sathe Fundamental Rights and Amendment to the Constitution

P B Gajendragadkar Law, Liberty and Social Justice

David Karrys Politics of Law

M.Sc. CHEMISTRY FIRST SEMESTER

COURSE CODE: MSC A02	**COURSE TYPE: ECC/CB**
COURSE TITLE: **GROUP THEORY, SPECTROSCOPY AND DIFFRACTION METHODS**	
CREDIT: **THEORY: 6** **PRACTICAL:**	**HOURS:** **THEORY: 90** **PRACTICAL: 00**
MARKS: **THEORY: 70+30** **PRACTICAL:**	**MARKS** **THEORY:** **PRACTICAL:**

OBJECTIVE: To study the diffraction techniques and to learn about group theory and spectroscopy.

UNIT-1 18 Hours

Diffraction Techniques : Miller indices; X-ray diffraction – Bragg Law, Laue method; Debye-Scherrer method of X-ray structural analysis of crystals; Index reflections; Identification of unit cells from systematic absences in diffration pattern; X-ray diffration method for Identification of crystalline compound.

UNIT-2 18 Hours

Group Theory: Symmetry elements and symmetry operation, definitions of group,subgroup, Group and subgroup. Schonflies symbols, representations of groups bymatrices (representation for the Cn, Cnv, Cnh, Dnh etc. groups to be worked outexplicitly.). Character of a representation. The great orthogonality theorem (withoutproof) and its importance. Character tables and their use in spectroscopy

UNIT-3 17 Hours

Photoelectron Spectroscopy : Photo-electric effect, ionizagtion process, Koopman's theorem. Photoelectron spectra of simple molecules. Electronically excited states: Fluorescence, phosphorescence and Chemiluminscence; Fluorescence Spectroscopy: Principle, basic instrumentation and Applications.

UNIT-4 19 Hours

Nuclear Magnetic Resonance Spectroscopy (NMR): Theory of NMR: Nuclear spin, nuclear resonance, saturation, shielding of magnetic nuclei, deshielding; Chemical Shift and its measurements, factors influencing chemical shift; Spin-spin interactions, factors influencing coupling constant 'J' Spin decoupling; Instrument –basic ideas; Applications of NMR; Basic idea of 13C NMR and FT NMR, advantages of FT NMR.

UNIT-5 18 Hours

Electron Spin Resonance Spectroscopy(ESR): Basic principle: zero field splitting, factors affecting the 'g' value. Isotropic and anisotropic hyperfine coupling constants, spin Hamiltonian, spin densities, Measurement techniques, ESR instrumentation and applications.

RECOMENDE READINGS:

1. Modern Spectroscopy, J.M.Hollas, John Wiley.
2. Applied Electron Spectroscopy for Chemical Analysis Ed. H. Windawi and F.L.Ho, Wiley Interscience.
3. NMR, NQR, EPR and Mossbauer Spectroscopy in Inorganic Chemistry, R.V.Parish, Ellis Harwood.
4. Physical Methods in Chemistry, R.S.Drago, Saunders College.
5. Chemical Applications of Group Theory. F.A. Cotton
6. Indroduction to Molecular Spectroscopy, G.M.Barrow, McGraw Hill
7. Basic Principles of Spectroscopy. R. Chang, McGraw Hill
8. Theory and Applications of UV Spectroscopy, H.H.jaffe and M. Orchin, IBHOxford.
9. Introduction to Photoelectron Spectroscopy, P.K.Ghosh, John Wiley
10. Introduction to Magnetic Resonance, A. Carrington and A.D.Maclachalan, Harper & Row.
11. Principles of Instrumentation Analysis, D.A. Skoog and J.J.LearyPubl Saunders, USA

M.Sc. CHEMISTRY FIRST SEMESTER			
COURSE CODE: MSC A03			**COURSE TYPE: ECC**
COURSE TITLE: **COMPUTER PROGRAMMING IN CHEMISTRY**			
CREDIT: **THEORY:** **6**	**PRACTICAL:**	**HOURS:** **THEORY:** **90**	**PRACTICAL:** **00**
MARKS: **THEORY:** **70+30**	**PRACTICAL:**	**MARKS** **THEORY:**	**PRACTICAL:**

OBJECTIVE: To study about computer programming and its application in Chemistry.

UNIT-1 — 18 Hours

Fundamentals of Programming

Generation for Computer Languages, Principles of Programming : Algorithm, Pseudo code and flowchart

UNIT-2 — 18 Hours

Introduction to C and Programming: Constants, variables, operators and expressions, data input and output, format specifications, control statements, nesting of loops, arrays and subscripted variables, functions and subroutines.

UNIT-3 — 19 Hours

Numerical Analysis*:* Data fitting by least square, Newton–Raphson and iterative methods for solving non-linearequations; Linear simultaneous equations - Cramer's rule, Gauss elimination method and Gauss-Seidel method; Numerical integration – interpolation, Gauss's quadrature formula; trapezoidalmethod, Simpson's 1/3 rule.

UNIT-4 — 20 Hours

Development of small computer codes involving simple formula in Chemistry such as vender Wall equation, pH titrations, Kinetics radioactive decay, evaluation of lattice energy and ionic radii, Secular equation (within Huckel theory), Elementary structural features such as bond length, bond angles, di-hedral angles etc. of molecule extracted from a data base such as Cambridge data base.

UNIT-5 — 15 Hours

Introduction and use of computer packages

MS Word and Excel, preparation of graphs and charts

RECOMENDE READINGS:

1. W. E. Mayo & M. Chiakala. Programming with FORTRAN 77, chaum's Outline Series,
New Delhi (1995).
2. E. Balagurusamy. Computer Oriented Statistical and Numerical Methods, Macmillan India
Ltd. (1988).
3. A. C. Norris. Computational Chemistry: An Introduction to Numerical Methods, John Wiley,
New York (1981).

M.Sc. CHEMISTRY FIRST SEMESTER			
COURSE CODE: MSC A04			**COURSE TYPE: ECC/CB**
COURSE TITLE: **MEDICINAL CHEMISTRY**			
CREDIT: **THEORY:** **PRACTICAL:** **6**		**HOURS:** **THEORY:** **90**	**PRACTICAL:** **00**
MARKS: **THEORY:** **70+30**	**PRACTICAL:**	**MARKS** **THEORY:**	**PRACTICAL:**

OBJECTIVE: to learn about additives in drug analysis And Synthesis.

UNIT-1 16 Hours

PRINCIPLES & CONCEPT OF GREEN CHEMISTRY:

Introduction –Concept and Twelve Principlesof green chemistry, -development of Green Chemistry- Atom economy reactions –rearrangement reactions , addition reactions- atom uneconomic-sublimation-elimination-Wittig reactions-toxicity measures- Need of Green Chemistry in our day to day life.: Environmental friendly green techniques-solvent supported catalysts and reagents, heterogenous reactions .calculations related to solvent extractions, stochiometry organic reactions and steam distillation

UNIT-2 16 Hours

PHARMACEUTICAL CHEMISTRY:

Introduction, Classification, mode of action adverse Side effect and their synthesis of following drugs-

antibacteirials Drugs- sulpha acetamide , dapsone ,

antimycobacterial drugs- ofloxacin, ciprofloxacine Hydrochloride

antineoplastic- Azothiopurine, Lomustine, dactinomycin,

antipyretic and Analgesics- Quinoline derivatives, aspirin, paracetamol.

Dignostic and therapeutic isotopes application in pharmacy and medicine -^{125} I , ^{32}P , ^{51}Cr , ^{60}Co , ^{59}Fe, ^{99m}Tc

UNIT-3 18 Hours

ANTIBIOTIC DRUGS :

Introduction, classification, mechanisum of action,and synthesis of antibiotics- .penicillins,ampicillin, cephalexin, cefixime, tetracyclines ,chloramphenicol, Anticancer Antibiotic -Daunorubcin, ,

UNIT -4 22 Hours

DRUG SYNTHESIS :Synthesis of the following drugs -

a. Anxiolytics – Benzodiazepines

,b. Neuroleptics – Phenothiazines,

c. Hypnotics and Sedatives – Barbitone, Phenobarbital, Glutethimide ,

d. Local anesthetics – Aminobenzoic acid and its derivatives,

e. Diuretics -Triamterene,Quinethazone

f. Anthelmintic agents-piperazine, Albendazole

g. Antihistaminic agents – Ethylenediamine derivatives,

h. Antimalarials – Aminoquinolines ,pamaquine., primaquine

j. Anti – inflammatory –Ibufenac

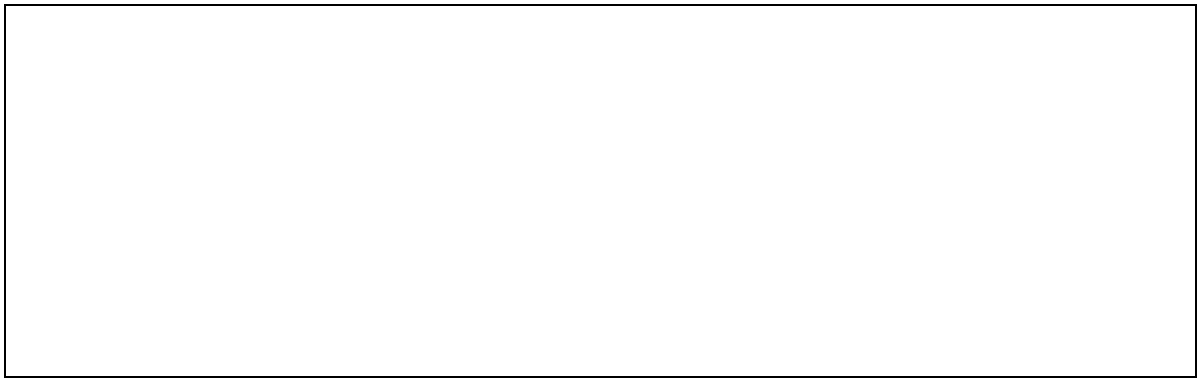
UNIT-5 18 Hours

DRUG DESIGN:

Development of new drugs, Procedures followed in drug design. Structure Activity Relationship (SAR) of morphines and Penicillins. Physico – chemical parameters: Lipophilicity, partition coefficient, electronic ionization constants, Quantitative Structure Activity Relationship. Free – Wilson analysis, Hansch analysis, relationships between – Wilson and Hansch analysis – case study..

SUGGESTED READING BOOKS

1. Wilson and Gisvold's, Text Book of Organic Medicinal and Pharmaceutical Chemistry, Ed Robert F.DOrge
2. RashmiSanghi and MM, Green Chemistry – Environment Friendly Alternatives, Srivastavasa, Narosa Publishers, New Delhi
3. Hougen, O.A., K.M. Watsen, and R.A. Ragartz, Chemical Process Principles, Part – I, John Wiley and Asia Publishing Co.,1975
4. Graham L. Patrick, An introduction to Medicinal Chemistry, Oxford, Edition II
5. Ilango, K and P. Valentina, Text Book of Medicinal Chemistry, Volume-I, Kreethi Publishers 7. AshutoshKar, Medicinal Chemistry, Edition III, New Age International Publishers.
6. Ishar, M.P.S and Abdul Faruk, Syntheses of Organic Medicinal Compounds, Narosa Publishing House
7.. A Gringuage, Introduction to Medicinal Chemistry, Wiley – VCH
8. Wolff, M.E., Burger's Medicinal Chemistry and Drug Discovery, Vol-I (Chap 9 & 14), Ed., John Wiley
9.. Goodmann and Gilman's Pharmacological Basis of Therapeutics, McGraw Hill.
10. Wilson and Gisvold's Text book of Organic Medicinal and Pharmaceutical Chemistry, Ed Robert F. Dorge.
11.Ashutosh Kar ,Medicinal chemistry,6th edn, New Age International.



M.Sc. CHEMISTRY FIRST SEMESTER

COURSE CODE: MSCS01 **COURSE TYPE: OSC**

COURSE TITLE:RESEARCH METHODOLOGY & COMPUTER APPLICATION: BASICS

CREDIT: 06	**HOURS : 90**
THEORY: 06	**THEORY: 90**

MARKS : 100
THEORY: 70 CCA : 30

OBJECTIVE:

- Understands the concept and place of research in concerned subject
- Gets acquainted with various resources for research
- Becomes familiar with various tools of research
- Gets conversant with sampling techniques, methods of research and techniques of analysis of data
- Achieves skills in various research writings
- Gets acquainted with computer Fundamentals and Office Software Package .

UNIT-1 18 Hours

CONCEPT OF RESEARCH :

Meaning and characteristics of research , Steps in research process , Types of research - i) Basic, applied and action research ii) Quantitative and qualitative research , Areas of research in concern discipline

SELECTION OF PROBLEM FOR RESEARCH :

Sources of the selection of the problem , Criteria of the selection of the problem ,Drafting a research proposal , Meaning and types of variables ,Meaning and types of hypotheses.

UNIT-2 18Hours

TOOLS OF RESEARCH :

Meaning and general information about construction procedure of (i) Questionnaire, (ii) Interview, (iii) Psychological test, (iv) observation (v) Rating scale (vi) Attitute scale and (vii) check list , Advantages and disadvantages of above tools

SAMPLING :

Meaning of population and sample , Importance and characteristics of sample , Sampling techniques - i) Probability sampling : random sampling, stratified random sampling, systematic sampling, cluster sampling ii) Non-probability sampling: incidental sampling, purposive sampling, quata sampling

UNIT-3 18 Hours

METHODS OF RESEARCH:

Meaning and conducting procedure of following methods of research : Historical method , Survey method , Case study , Causal comparative method , Developmental methods , Experimental methods

UNIT-4 18 Hours

TREATMENT OF DATA :

Level of measurements of data , Steps in treatment of data: editing, coding, classification, tabulation, analysis and interpretation of results

WRITING RESEARCH REPORT :

Sections of report : Preliminary section , Content section : various chapters , Supplementary section : appendices, references, abstract , Format and style

UNIT-5 18 Hours

Computer Fundamentals:

Computer System : Features, Basic Applications of Computer, Generations of computers.

Parts of Computer System : Block Diagram of Computer System ; Central Processing Unit (CPU) ; Concepts and types of Hardware and Software, Input Devices - Mouse, Keyboard, Scanner, Bar Code Reader, track ball ; Output Devices - Monitor, Printer, Plotter, Speaker ; Computer Memory - primary and secondary memory, magnetic and optical storage devices.

Operating Systems - MS Windows : Basics of Windows OS ; Components of Windows - icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders ;

Word Processing - MS Word : Creating, Saving, Opening, Editing, Formatting, Page Setup and printing Documents ; Using tables, pictures, and charts in Documents ; Using Mail Merge sending a document to a group of people and creating form, letters and label.

Spreadsheet - MS Excel : Opening a Blank or New Workbook, entering data/Function/ Formula into worksheet cell, Saving, Editing, Formatting, Page Setup and printing Workbooks.

Presentation Software - MS Power Point : Creating and enhancing a presentation

SUGGESTED READINGS

Agrawal, Y. P. (1988). ***Better sampling : Concepts, Techniques and Evaluation.*** *New Delhi : sterling Publishers Private Ltd. Best, J. W. (1993).*
Research in Education *(6th ed.) New Delhi : Prentice-Hall of India Pvt. Ltd.*
Broota, K. D. (1992) ***Experimental design in Behavioral Research*** *(2nd ed.)*
New Delhi : Wiley Eastern Limited.
Dasgupta, A. K. (1968). ***Methodology of Economic Research****. Bombay: Asia Publishing House.*
Edwards, A. L. (1957). ***Techniques of Attitude Scale construction.*** *New York : Appleton-Contury*
Gall, M. D., Gall, J. P. and Borg, W. R. (2007). ***Educational Research : An introduction***
(8th ed.) Coston : Allyn and Bacon.
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