Dr. B.R.Ambedkar University, Srikakulam

General Regulations relating to
POST GRAUDATE AND PROFESSIONAL COURSES

Revised Syllabus for P.G. Courses with Choice Based Credit System (CBCS) for the academic year 2016-17

0. Candidates seeking admission for the Masters/Professional Degree Courses shall be required to have passed the qualifying examination prescribed for the course of any University recognized by Dr. B.R. Ambedkar University, Srikakulam as equivalent there to

1. The course and scope shall be as defined in the Scheme of Instruction and syllabus prescribed.

2. The course consists of 2/4/6 semesters, @ two semesters/year, unless otherwise specified.

3. The candidates shall be required to take an examination at the end of each semester of the study as detailed in the Scheme of Examination. Each semester theory paper carries a maximum of 100 marks, of which 85 marks shall be for semester-end theory examination of the paper of three hours duration and 15 marks shall be for internal assessment

4. (a) Internal Assessment for 15 Marks: Two mid-term exams, one conventional (descriptive) and the second – 'on-line' with multiple choice questions for each theory paper shall be conducted. The average of these two mid-term exams shall be taken as marks obtained for the paper under internal assessment. If any candidate appears for only one mid-term exam, the average mark, dividing by two shall be awarded. If any candidate fails to appear for both the mid term exams of a paper, only marks obtained in the theory paper shall be taken into consideration for declaring the result. Each mid-term exam shall be conducted only once.

4. (b) Candidates shall be declared to have passed each theory paper if he/she obtains not less than E Grade ie., an aggregate of 40 % of the total marks inclusive of semester-end and internal assessment marks in each paper.

5. A candidate appearing for the whole examination shall be declared to have passed the examination if he/she obtains a Semester Grade Point (SGP) of 5.0 and a CGPA of 5.0 to be declared to have passed the Course.

6. Not withstanding anything contained in the regulations, in the case of Project Report/Dissertation/ Practical/Field Work/Viva-voce etc., candidates shall obtain not less than D grade, i.e., 50% of marks to be declared to have passed the examination.
7. ATTENDANCE: Candidates shall put in attendance of not less than 75% of attendance, out of the total number of working periods in each semester. Only such candidates shall be allowed to appear for the semester-end examination.

7. (a) A candidate with attendance between 74.99% and 66.66% shall be allowed to appear for the semester-end examination and continue the next semester only on medical and other valid grounds, after paying the required condonation fee.

7. (b) In case of candidates who continuously absent for 10 days without prior permission on valid grounds, his/her name shall automatically be removed from the rolls.

7 (c) If a candidate represents the University at games, sports or other officially organized extra-curricular activities, it will be deemed that he/she has attended the college on the days/periods

8 Candidates who put in a minimum of 50% attendance shall also be permitted to continue for the next semester. However, such candidates have to re-study the semester course only after completion of the course period for which they are admitted. The candidate shall have to meet the course fees and other expenditure.

9 Candidates who have completed a semester course and have fulfilled the necessary attendance requirement shall be permitted to continue the next semester course irrespective of whether they have appeared or not at the semester-end examination, at their own cost.

Such candidates may be permitted to appear for the particular semester-end examination only in the following academic year; they should reregister/ reapply for the Semester examination.

The above procedure shall be followed for all the semesters

10. Candidates who appear and pass the examination in all the papers of each and every semester at first appearance only are eligible for the award of Medals/Prizes/Rank Certificates

11. BETTERMENT: Candidates declared to have passed the whole examination may reappear for the same examination to improve their SGPA, with the existing regulations without further attendance, paying examination and other fees. Such reappearance shall be permitted only with in 3 consecutive years from the date of first passing the final examination. Candidates who wish to appear thereafter should take the whole examination under the regulations then in vogue.

12. The semester-end examination shall be based on the question paper set by an external paper-setter and there shall be double valuation for post-Graduate courses. The concerned Department has to submit a panel of paper-setters and examiners approved by the BOS and the Vice-chancellor nominates the paper-setters and examiners from the panel.

13. In order to be eligible to be appointed as an internal examiner for the semester-end examination, a teacher shall have to put in at least three years of service. Relaxation of service can be exempted by the Vice-Chancellor in specific cases.

14. If the disparity between the marks awarded in the semester-end examination by internal and external examiners is 25% or less, the average marks shall be taken as the mark obtained in the paper. If the disparity happens to be more, the paper shall be referred to another examiner for third valuation. In cases of third valuation, of the marks obtained either in the first or second valuation marks, whichever is nearest to the third valuation marks are added for arriving at the average marks.

15. Candidates can seek revaluation of the scripts of the theory papers by paying the prescribed fee as per the rules and regulations in vogue.

16. The Project Report/Dissertation/ Practical/Field Work/Viva-voce etc shall have double valuation by internal and external examiners.

17. A Committee comprising of the HOD, one internal teacher by nomination on rotation and one external member, shall conduct viva-voce examination. The department has to submit the panel, and the Vice-chancellor nominates viva-voce Committee.

18. Grades and Grade Point Details (with effect from 2009-10 admitted batches)

S. No	Range of Marks	Grade	Grade Points
1.	> 85 %	O	10.0
2.	75 % – 84 %	A	9.0
3.	67 % - 74 %	B	8.0
4.	58 % - 66 %	C	7.0
5.	50 % - 57 %	D	6.0
6.	40 % - 49 %	E	5.0
7.	< 39 %	F (Fail)	0.0
8.	Incomplete: (Shall be upgraded from E to O Grade on subsequent appearance of the same semester. I The corresponding Grade Points will be awarded)		

19. Calculation of SGPA (Semester Grade Point Average) & CGPA (Cumulative Grade Point Average):

For example, if a student gets the grades in one semester A,A,B,B,B,D in six subjects having credits 2(S1), 4(S2), 4(S3), 4(S4), 4(S5), 2(S6), respectively. The SGPA is calculated as follows:

$$SGPA = \frac{\{9(A)x2(S1)+9(A)x4(S2)+8(B)x4(S3)+8(B)x4(S4)+8(B)x4(S5)+6(D)x2(S6)\}}{\{2(S1)+4(S2)+4(S3)+4(S4)+4(S5)+2(S6)\}} = \frac{162}{20} = 8.10$$

i. A student securing 'F' grade thereby securing 0.0 grade points has to appear and secure at least 'E' grade at the subsequent examination(s) in that subject.

ii. If a student gets the grades in another semester D, A, B, C, A, E, A, in seven subjects having credits 4(S1), 2(S2), 4(S3), 2(S4), 4(S5), 4(S6), 2(S7) respectively,

$$\text{SGPA} = \frac{\{6(D)x4(S1)+9(A)x2(S2)+8(B)x4(S3)+7(C)x2(S4)+9(A)x4(S5)+5(E)x4(S6)+9(A)x2(S7)\}}{\{4(S1)+2(S2)+4(S3)+2(S4)+4(S5)+4(S6)+2(S7)\}} = \frac{162}{22} = 7.36$$

$$\text{CGPA} = \frac{(9x2+9x4+8x4+8x4+6x2+6x4+9x2+8x4+7x2+9x4+5x4+9x2)}{(20+22)} = \frac{324}{42} = 7.71$$

a) A candidate has to secure a minimum of 5.0 SGPA for a pass in each semester in case of all PG and Professional Courses. Further, a candidate will be permitted to choose any paper(s) to appear for improvement in case the candidate fails to secure the minimum prescribed SGPA/CGPA to enable the candidate to pass at the end of any semester examination.

b) There will be no indication of pass/fail in the marks statement against each individual paper.

c) A candidate will be declared to have passed if a candidate secures 5.0 CGPA for all PG and Professional Courses.

d) The Classification of successful candidates is based on CGPA as follows:
   i) Distinction –CGPA 8.0 or more;
   ii) First Class –CGPA 6.5 or more but less than 8.0
   iii) Second Class –CGPA 5.5 or more but less than 6.5
   iv) Pass –CGPA 5.0 or more but less than 5.5

e) Improving CGPA for betterment of class will be continued as per the rules in vogue.

f) CGPA will be calculated from II Semester onwards up to the final semester. CGPA multiplied by “10” gives aggregate percentage of marks obtained by a candidate.

ANNEXURE – I

Eligibility

Course in	ualifying Examination for Admission
M.Sc Organic Chemistry	B.Sc Chemistry/Applied Chemistry(as main wherever applicable) as one of the subjects

ANNEXURE – II

M.Sc. ORGANIC CHEMISTRY

SCHEME OF INSTRUCTION

First Semester:

Course No.	Title of the Paper	Compulsory/Elective	No. of Periods of Instruction per Week
101	General Chemistry-I	Compulsory	6
102	Inorganic Chemistry-I	Compulsory	6
103	Organic Chemistry-I	Compulsory	6
104	Physical Chemistry-I	Compulsory	6
105	Lab-I: Inorganic Chemistry-I	Compulsory	12
106	Lab-II: Organic Chemistry-I	Compulsory	12
107	Lab-III: Physical Chemistry-I	Compulsory	12

Second Semester:

Course No.	Title of the Paper	Compulsory/Elective	No.of Periods of Instruction per Week
201	General Chemistry-II	Compulsory	6
202	Inorganic Chemistry-II	Compulsory	6
203	Organic Chemistry-II	Compulsory	6
204	Physical Chemistry-II	Compulsory	6
205	Lab-I: Inorganic Chemistry-II	Compulsory	12
206	Lab-II: Organic Chemistry-II	Compulsory	12
207	Lab-III: Physical Chemistry-II	Compulsory	12

Third Semester:

Course No.	Title of the Paper	Compulsory/Elective	No.of Periods of Instruction per Week
301	Organic Reaction Mechanism- I and pericyclic reactions	Compulsory	6
302	Organic spectroscopy-I	Compulsory	6
303	Organic synthesis -I	Compulsory	6
304	Organic natural products -I	Compulsory	6
305	Lab-I: Multi stage organic synthesis and Chromatography techniques	Compulsory	12

Fourth Semester:

Course No.	Title of the Paper	Compulsory/Elective	No.of Periods of Instruction per Week
401	Organic Reaction Mechanism- II and photochemistry	Compulsory	6
402	Organic spectroscopy -II	Compulsory	6
403	Organic synthesis-II	Compulsory	6
404	Organic natural products -II and Biopolymers	Compulsory	6
405	Lab-II: Organic Mixture analysis and Estimations	Compulsory	12

Each candidate has to present a paper on chemistry and related topics, according to the schedule given by the Department for 20 Minutes on Saturday in the SEMINAR conducted by the Department.
During all the four semesters the medium of instruction and writing examination is ENGLISH only.

Annexure - III

Scheme of Examination as per Credit System

First Semester:

Course No.	Title of the Paper	Credit	Max. Marks.	Double Valuation one External	Internal assessment/ viva-voce and record
101	General chemistry-I	4	100	85	15
102	Inorganic chemistry-I	4	100	85	15
103	Organic chemistry-I	4	100	85	15
104	Physical chemistry-I	4	100	85	15
105	Lab I : Inorganic Chemistry-I	2	50	40	10
106	Lab II : Organic Chemistry-I	2	50	40	10
107	Lab-III: Physical Chemistry-I	2	50	40	10
	Total	22	550	460	90

Second Semester:

Course No.	Title of the Paper	Credit	Max. Marks.	Double Valuation (Internal + External)	Internal Assessment / viva-voce and record
201	General chemistry-II	4	100	85	15
202	Inorganic chemistry-II	4	100	85	15
203	Organic chemistry-II	4	100	85	15
204	Physical chemistry-II	4	100	85	15
205	Lab I : Inorganic Chemistry-II	2	50	40	10
206	Lab II : Organic Chemistry-II	2	50	40	10
207	Lab-III: Physical chemistry-II	2	50	40	10
	Total	22	550	460	90

Third Semester:

Course No.	Title of the Paper	Credit	Max. Marks.	Double Valuation (Internal + External)	Internal Assessment / viva-voce and record
301	Organic reaction mechanism- I and Pericyclic reactions	4	100	85	15
302	Organic spectroscopy-I	4	100	85	15
303	Organic Synthesis-I	4	100	85	15
304	Natural products-I	4	100	85	15
305	Lab : I Multi stage organic synthesis and Chromatography techniques	6	150	125	25
Total		22	550	465	85

Fourth Semester:

Course No.	Title of the Paper	Credit	Max. Marks.	Double Valuation (Internal + External)	Internal Assessment/ viva-voce and record
401	Organic Reaction Mechanism-II and Photo chemistry	4	100	85	15
402	Organic spectroscopy-II	4	100	85	15
403	Organic synthesis-II	4	100	85	15
404	Organic natural products –II and Biopolymers	4	100	85	15
405	Lab-I: Organic Mixture analysis and Estimations	6	150	125	25
		22	550	465	85

Total Marks: - First, Second, Third & Fourth Semesters put together: 550+550+550+550 =2200

Total Credits: - First, Second, Third & Fourth Semesters put together: 22+22+22+22 = 88

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SYLLABUS

ORGANIC CHEMISTRY

I SEMESTER

COURSE-101: GENERAL CHEMISTRY-I

Unit I:

Wave equation – interpretation of wave; function – properties of wave function – normalization and orthogonalisation, Operators – Linear and non-linear-commutators of operator.

Unit II

Postulates of quantum mechanics, setting up of operators observables – Hermitian operator – Eiger values of Hermitian operator.

Wave mechanics of simple systems with constant potential energy, particle in one dimensional box – factors influencing colour-transition-dipole integral, Symmetry arguments in deriving the selection rules – the concept of tunneling

Unit III:

Particle; in a three dimensional box, Rigid rotor, Wave mechanics of systems with variable potential energy-simple harmonic oscillator-solution of waves equation – selection rules.

Unit IV:

Rotational spectra of diatomic ;molecules – Rigid rotor-Selection Rules-Calculation of bond length-isotopic effect, Second order start effect and its applications, Infrared spectra of diatomic molecules-harmonic and anharmonic oscillators- Selection rules-overtones-combination bands- Calculation of force constant, anharmonicity constant and zero point energy. Fermi resonance, Simultaneous vibration-rotation spectra of diatomic molecules.

UNIT V:

Raman effect-Classical and quantum mechanical explanations-Rotational Raman and Vibrational Raman spectra, Electronic spectra of diatomic molecules-Vibrational coarse structure-intensity of spectral lines-Franck Condon principle-applications, Rotational fine structure-band head and band shading, Charge transfer spectra.

Reference Books :

1.Quantum chemistry V edition by Iran . levine 2000 by pearson education
2. Quantum chemistry IV edition by A.K Chandra TataMcgrawHill publishing 1994
3. Fundenatals of molecular spectroscopy IV edition by colin N Banwell and Elaine M. Mc cash, Tata Mc graw Hill publishing.

I SEMESTER

COURSE-102: INORGANIC CHEMISTRY-I

UNIT – I:

Chemical Bonding: Application of VB, MO and VSEPR theories in Explaining the structures of simple molecules – role of 'P' and'd' orbital in $\prod$ - bonding.

UNIT – II:

Chemistry of main group elements: General trends in properties – Boron hydrides, carboranes, intercalation compounds – nitrogen – phosphorous, Boron – nitrogen and sulphur – nitrogen cyclic compounds.

UNIT – III:

Coordination compounds: Crystal field theory – Crystal field splitting patterns in Octahedral, tetrahedral, tetragonal, square planar, square pyramidal and trigonal bipyramidal geometries – Determination of crystal field splitting energy – calculation of crystal field stabilization energies –

UNIT IV

Factors affecting crystal field splitting energies – spectrochemical series – Jahn – Teller effect – Ligand field theory.

Term symbols – Russell – Saunders coupling – derivation of term symbols for various configurations.

UNIT – V:

Electronic Spectra of transition metal complexes – selection rules-break down of selection rules – Orgel and Tanabe Sugano diagrams

Magnetic properties of free ions – spin and orbital moments and spin – orbit coupling – quenching of orbital momentum by crystal fields in complexes.

Reference Books:

1. Advanced inorganic chemistry by F.A. Cotton and R.G. Wilkinson, IV Edition, Johnwiley and sons, Newyork, 1980.
2. Inorganic Chemistry by J.E. Huhey, III edition, Harper International Edition, 1983.
3. Theoretical Inorganic Chemistry II edition by M.C. Day and J. Selbin, Affiliated – East – West press Pvt, Ltd., New Delhi
4. Cocncise inorganic chemistry IV edition by J.D.Lee Black well publications, 1996

Course- 105: Inorganic Chemistry –I LAB I

Inorganic Qualitative analysis

Books suggested: Vogels text book of Inorganic qualitative analysis, pearson education.

I SEMESTER

COURSE-103: ORGANIC CHEMISTRY-I

UNIT – I

Structure and reactivity: Localised and delocalized convalent bond-Concept of reasonance and aromaticity-Huckel's rule for aromaticity in benzenold and non-benzenold compounds, anti-armaticity and ho,o-aromaticity. Nature of reaction energy and kinetic considerations – types of organic reactions – reagents – reactive intermediates. Their formation and stabilization – inductive and mesomeric effects.

UNIT – II

Stereochemistry and stereoisomerism. Conformational isomerism and analysis in acyclic and analysis in acyclic and simple ;cyclic systems – substituted ethanes, cyclopentane, cyclohexane cyclhexance, cyclo reactane and decalins, optical isomerism –optical activity molscular dissymmetry and chirality – elements of symmetry.

UNIT III

Fisher's projection D.L. and R.S. configurations – relative and absolute configurations optical isomerism due to asymmetric carbon atoms – optical isomerism in biphenyls, allenes and spirans - optical isomerism of nitrogenous compounds racemisation and resolution – geometrical isomerism and E,Z configurations, properties of geometrical isomers.

UNIT IV

Pyridne, quivoline, Isoquinoline, Indole, Benzofuran, Benzothiophene – Pyrodazine, immidazole, oxazole, Isoxazole, Thiazole, Isothiazole, Pyrizine and pyrazine.

UNIT – V: Chemistry of some typical natural products. A study of the following compounds involving their isolation, structure elucidation synthesis and biogenesis – flavonoids – quercetin, cyanding and genestein, terpeniods – terpeneol – pinene, amplhor, farnesol.

Text Books:

1. Organic Chemistry Vol. I (6^{th} Edition) and Vol. II (5^{th} Edition) by IL fial ELBS.

2. Organic Chemistry (5^{th} Edition) by Morrison and Boyd, PHI, India.

3. Organic Chemistry (5^{th} Edition) by Francis A. Carey Tata Mc Graw Hill publishing company Limited, New Delhi.

4. Reaction Mechanism in Organic Chemistry by Mukherjee Singh, Macmillian, India.

5. A guide book to mechanism in Organic Chemistry by pater Sykes, ELBS.

REFERENCE BOOKS:

Advanced Organic Chemistry by Jerry March (4th Edition) wiley Basis.

Chemistry of Natural Products, K.W. Bent by stereochemistry of carton by E.Eliel, John willey & Sons, Inc.

Stereochemistry of Organic compounds by D. Nasipun.

Chemistry of Natural products by P.S. Kalsi Kalyani publishers, 1983.

Course- 106: ORGANIC CHEMISTRY- I LAB II

1. Part A: Synthesis of six organic compounds involving one or two stages.

Books Suggested for Practicals:

Vogels text book of Practical Organic chemistry,V th edition by B.S.Furniss,A.J.Hanna ford, P.W.G. Smith and A.R.Tatchell, Pearson Education,1989

I SEMESTER

COURSE-104: PHYSICAL CHEMISTRY-I

UNIT I:

States of matter: Transport properties of Gases – Thermal Conductivity – Viscosity-Diffusion. Theories of liquid structure; Calculation of Collision numbers.

UNIT II

Solids : X-Ray diffraction studies: Bragg's equation – Crystal structure determination; lattice type and lattice dimensions – crystal Defects – Band theory of solids – Semiconductors – Theories of Specific heats of solids.

UNIT III:

Thermodynamics: Free energy, entropy and enthalpy – chemical equilibrium – Thermodynamic criteria of the chemical equilibrium – Effect; of temperatures on equilibrium constant – Vant Hoff isochore Maxwell relations – Gibbs-Duhem equation; Duhem-margules equations. Classius-Clapeyron equations–Nernst heat theorem; Third law of thermodynamics and determination of absolute entropy – Limitation of third law of thermodynamics.

UNIT IV:

Kinetics I: Theories of reaction rates – collision theory – limitation; transitation state theory – effect of ionic strength – Debye – Huckle theory – primary and secondary salt effects – effect of dielectric constant of solvent-ion-ion interaction; solvent models – Born-Abharam, Langevin dipole model.

UNIT V:

Kinetics II: Effect of substituent – Hamett equation – limitations – Taft equation – prediction of rate constant of a reaction; consective reactions, parallel reactions, opposing reactions (unimolecular steps only – no derivation) specific and general acid-basic catalysis – Skrabal diagram – fast reactions – flow systems – temperature and pressure jump methods – relaxation.

Reference Books:

1. Physical chemistry volumes 2nd edition by K.L.Kapoor Published by Macmillan 2005.
2. Physical chemistry, Gilbert W.Castellan 3rdedition Published by Narosa publishing house.
3. Thermodynamics for chemists by Samuel Glasstone Published by Litton educational publishing.
4. Physical Chemistry 7th edition, 2002 by Atkins and paule Published by Oxford University press.
5. Kinetics and Mechanisms of chemical transformations, J Raja ram, J C Kuriacose, Published by Macmillan India Ltd.

Course- 107: PHYSICAL CHEMISTRY-I LAB III

1. Critical Solution Temperature of partially misciple liquids – Phenol – Water System.
2. Effect of electrolyte (NaCl) on Miscibility temperature.
3. Determination of cell constant.
4. Determination of pka value of acetic acid by Conductometric method.
5. Conductometric Titration of a strong acid with strong Bade (HCl vs NaOH).
6. Conductometric Titration of a weak acid with strong Base (ACOH vs NaOH).

BOOKS SUGGESTED:

1. Practical Experiments in Physical Chemistry by Alaxender Finllay.
2. Experiments in Chemistry by D.V. Jajargordam., Himalaya Publishing House, 2003
3. Physical Chemistry experiments by P. Ghosh.

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SYLLABUS-ORGANIC CHEMISTRY
II SEMESTER

COURSE-201: GENERAL CHEMISTRY-II

UNIT I:

Hydrogen atom-solution of R (r), θ (θ) and ∅ (ø) equations-probability density in

orbital-shapes of orbital. Perturbation theory-time independent Perturbation (only first order perturbation is to be dealt with) - application to ground state energy of helium atom

UNIT II

Variation principle – applications – calculation of zero point energy of harmonic oscillator – many electron atom – Hartee – Fock self – consistent field method (qualitative treatment only). Valence bond approach – directed valance – hybridization

UNIT III:

Covalent bond – calculation of ionic and covalent bond contributions in hydrogen molecule. Molecular orbital theory – LCAO approximation – hydrogen molecule ion – hydrogen molecule (fundamental concepts only) – the electronic transitions in the hydrogen molecule.

MOLECULAR SYMMETRY AND GROUP THEORY:
UNIT IV

Basic concepts of Symmetry and group theory - Symmetry elements, Symmetry operations and point groups - Schoenflies symbols - Classification of molecules into point groups - Axioms of group theory – group multiplication tables for C_{2V} and C_{3V} Point groups – Similarity Transformation and classes – Representations – reducible and irreducible representations, Milliken symbols, Orthogonality theorem and its implications, Character table and its anatomy

UNIT V: ELEMENTS OF COMPUTER PROGRAMMING:

Basic components of computers, higher and lower level languages, Microsoft Fortran : Constants, variables and operators, arithmetic expression, assignment and replacement statement, Input and Output statements – Format free and format directed I/O statements –Iw, Fw.d, Ew.d and Gw.d format specifications, conditional and unconditional statements. Logical IF, Block IF and GO TO statements, DO statement – syntax and rules.
Applications to chemical problems: Flow charts and Programs

Reference Books:

1. Quantum chemistry V edition by Iran. levine 2000 by pearson education
2. Quantum chemistry IV edition by A.K Chandra TataMcgrawHill publishing 1994
3. Chemical applications of group theory by F. Albert cottonpublished by Johan wily and sons.
4. FORTRAN 77 by V.Rajaraman, Published by Prentic – Hall of India Ltd.

II SEMESTER

COURSE-202: INORGANIC CHEMISTRY-II

UNIT I:

Chemistry of Transition elements: Comparative study of the first second and third transition series. Metal cluster compounds favorable conditions for their formation – structure and bonding in the following halied and carboxylate metal – cluster compounds.

$Re_2Cl_8^{2-}$, $Mo_2Cl_8^{4-}$, $Re_2(RCOO)_4X_2$, $Mo_2(RCOO)_4(H_2O)_2$, $Cr_2(RCOO)_4(H_2O)_2$, $Cu_2(RCOO)_4(H_2O)_2$, $Cr_2Cl_9^{3-}$, $Mo_2Cl_9^{3-}$, $W_2Cl_9^{3-}$, Re_3Cl_9, $Re_3Cl_{12}^{3-}$, $Mo_6Cl_8^{4+}$, $Nb_6X_{12}^{2+}$ and $Ta_6X_{12}^{2+}$

UNIT II:

Chemistry of Inner Transition elements: Chemistry of Lanthanides electronic configurations – oxidation states – lanthanide contraction and its consequences-magnetic and special properties – separation of lanthanides.

Chemistry of actinides : - synthesis of Tran uranium elements, electronic configurations, oxidation states, position in the periodic table – actinide contraction – comparison of magnetic and spectral properties of actinides with those of lanthanides .

UNIT III:

Metal Ligand Equilibria in solution: Stepwise and overall formation constants, trends in stepwise constants factors affecting the stability of metal complexes – chelate effect – Determination of stability constants of complexes – Spectrophotometric method and P^H – metric method.

UNIT IV:

Inorganic Reaction Mechanisms: Inert and labile complexes-Explanation of lability on the basis of CFSE. Substitution reactions of metal complexes – D, Id, Ia and A mechanisms – ligand replacement reactions of octahedral, complexes

UNITV:

Acid Hydrolysis, Anation and base hydrolysis of cobalt (III) Complexes – ligand displacement reaction of square plants, complexes of platinum (II) – trans affect mechanism of trans effect (Theories) – Electron transfer reactions of complexes – Inner and outer sphere mechanisms.

BOOKS: In addition to the books mentioned under Inorganic Chemistry Paper – I syllabus, the following are suggested.

1. Chemistry of Lanthanides by T.Moeller, Chapman and Hall
2. Man-made Transuranium elements by G.T.Seaborg.
3. Mechanisms of Inorganic Reactions in solution by D.Benson. MC graw Hill. London, 1968.

COURSE-205: Inorganic Chemistry –II LAB I

Inorganic Quantitative analysis.

Books suggested: Vogels Inorganic qualitative analysis, pearson education

II SEMESTER

COURSE-203: ORGANIC CHEMISTRY- II

UNIT I:

Aromatic substitution reactions – electrophilic, nucleophilic and through benzynes – redical substitution of arenes – orientation of nucleophilic substitution at a saturated carbon, SN_1, SN_2, SN_i reactions – effect of structure, nucleophile, leaving group, solvent. Additions involving elctrophiles, nucleophiles and free radicals.

UNIT II

Elimination reactions – E_1, $E1_{CB}$, E2 reactions – elimination versus substitution reactions. Ene – reaction, Benzoin Condensation, Stork enamine reactions

UNIT III

Mechanism of some name reactions: Aldol, Perkin, Cannizaro, Wittig, Grignard, Reformatsky – Meerwein, Hoffmann Claisen and Favorsk, rearrangements. Hydroboration – openauer oxidation, clemmensen reduction – Meeraein pondorf and verley and Birch reductions. , Michael addition, Mannich Reaction, Diels – Alder reaction, , Bayer – Villiger Reaction.

UNIT IV:

Spectra and structure application of organic spectroscopy, UV, IR, HNMR and Mass spectral data.

UNIT V:

Isolation, structure elucidation and synthesis of alkaloids; atropine, nicotine, and Quinine. Purines – Caffeine configuration and ring structures of glucose and fructose, anomeric effects.

Text Books:

1. Organic Chemistry Vol. (Sixth Edn) and Vol. II (Fifth Ed,.) by it finar ELBS.
2. Organic Chemistry (fifth Edn.,) by Morrison and Boyd, PHL., India
3. Organic Chemistry fifth adition by Francis A. Carey Tata Mc Graw Hill publishing company Limited, New Delhi.
4. Reaction Mechanism in Organic Chemistry by Mukherjee Singh, Macmillan, India.
5. A guide book to mechanism in Organic Chemistry by peter Sykes, ELBS

REFERENCE BOOKS:

Advanced organic chemistry by Jerry March (4^{th} Edition) Wiley Eastern.
Chemistry of Natural Products, K.W.Bentley by stereochemistry of carbon compounds by E.Eliel, John Wiley & Sons,Inc.
Stereochemistry of Organic compounds by D.Nasipuri.
Chemistry of Natural Products by P.S.Kalsi Kalyani Publishers. 1983.

COURSE-206: ORGANIC CHEMISTRY-II LAB-II

1. PART B: Functional group identification (one or two functional groups) of organic compounds and preparation of its derivatives (at least two) .

Books suggested:

Vogels text book of Practical Organic chemistry,V th edition by B.S.Furniss,A.J.Hanna ford, P.W.G. Smith and A.R.Tatchell, Pearson Education,1989

II SEMESTER

COURSE-204: PHYSICAL CHEMISTRY- II

Physical methods of moleciles structure elucidation

UNIT I:

Magnetic properties of molecules – theories Of molecule magnetic susceptibility – measurement of magnetic structure susceptibility – Principle and theory of NMR elucidation spectroscopy – Nature of spinning particle and its interaction with magnetic field

UNIT II

chemical shift and its Origin – spin- spin interaction – experimental methods – applications of NMR studies in structural elucidation – structure of ethanol, dimethyl formamide, styrene and acetophenone.

UNIT III

Electron spin Principle and experimental technique – g-factor; Resonance: line shapes and line width – hyperfine interactions

applications of ESR studies to the structure of free radicals. Metal complexes and biological systems.

UNIT IV

Photochemistry : Fluorescence – delayed fluorescence; E(osine) and P (yrin) type phosphorescence Jabanowski diagram , photo physical process – intersystem crossing or internal conversion, derivation of Stern-Volmer equation – Quantum yield Quenching effect – Photo chemical equilibrium.

UNIT V

Electrochemistry: Electrochemical cell – Galvanic and electrolytic cell concentration cell with and without transference – effect of complexation on redox potential – ferricyanide/ferrocyanide couple: Iron(III) phenanthroline/Iron(II) phenantroline Couple: Determination of standard potential-activity coefficients from EMF data.

Reference Books

1. Fundenatals of molecular spectroscopy IV edition by colin N Banwall and Elaine M. Mc cash, Tata Mc graw Hill publishing

.2. Physical Chemistry 7^{th} edition, 2002 by Atkins and paule Published by Oxford University press.

3. Physical chemistry volumes 2^{nd} edition by K.L.Kapoor Published by Macmillan 2005.

4. An introduction to electrochemistry by Samuel Glasstone 1942, Letton educational publishing

5.Fundamentals of photochemistry by K.K. Rohatgi Mukherjee, New age international publishers ,1986

COURSE-207: PHYSICAL CHEMISTRY- II LAB-III

1. Determination of Composition of Cuprammonium Cation.
2. Determination of Equilibrium Constant of the reaction : $KI + I_2 = KI_3$.
3. Conductometric Titration of mixture of a strong acid and weak acid with a strong Base (HCL + ACOH) vs NaOH.
4. Potentiometric Titration of iron (II) with K2Cr2O7.
5. Determination of relative strength of acids (HCl) by Ester Hydrolysis.
6. Polarimetric Determination of relative strength acids by hydrolysis of sucrose.

BOOKS SUGGESTED:

1. Practical Experiments in Physical Chemistry by Alaxender Finllay.
2. Experiments in Chemistry by D.V. Jajargordam., Himalaya Publishing House, 2003
3. Physical Chemistry experiments by P. Ghosh.

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ORGANIC CHEMISTRY-SYLLABUS

III- SEMESTER
COURSE-301: Organic Reaction Mechanism –I and Pericyclic Reactions

UNIT- I: Aliphatic Nucleophilic Substitution Mechanism Nucloeophilic Substitution: Substitution Reaction of Ambident Nucleophiles, Neighbouring group participation of O, S, N, halogens, aryl groups, alkyl and cycloalkyl groups in nucleophilic substitution reactions. Sigma, Pi bond participation in acyclic and bicyclic systems (Non-classic carbocations) substitution at allylic, trigonal and Vinylic carbons, hydrolysis of esters, Mayer's aldehydes, ketones and carboxylic acids, alkylation with trialkyl boranes.

Aliphatic electrophilic substitutions: SE^1 SE^2 and SEi mechanisms hydrogen exchange, migration of double bonds, halogenation of aldehydes, ketones, acids, acylhalides sulphoxides and sulphones, aliphatic diazonium coupling, nitrosation at Carbon and nitrogen diazo transfer reaction carbene and nitrene insertion, formation of sulphurylide, metalation with organometallic compounds and with metals. Decarboxylation of aliphatic acids. Haloform reaction and Haller-Baner reaction.

UNIT- II: Aromatic nucleophilic substitution: A general introduction to different mechanisms of aromatic substitution Ar SN, SN^1 and aryne, asymmetric nucleophilic aromatic substitution reactions, von-richter rearrangement, sommlet Hauser rearrangement, Smiles rearrangement, Bamberger rearrangement.

UNIT – III: Radical substitution Mechanism: Reaction of Sp^3 Carbon: Reactivity in aliphatic substrates reactivity at bridged position, reactivity at Sp^2 carbon. Reactivity in aromatic substrates, neighboring group assistance in free radical reactions, effect of reactivity in the attacking radical effect of solvent on reactivity halogenation at an alkyl carbon and allylic carbon, hydroxylation at aromatic carbon by means of Fenton's reagent, oxidation of aldehydes to carboxylic acids, formation of cyclic ethers with $Pb(OAC)_4$, Reed reaction, Sandmayer reaction, Kolbe reaction the Hunsdiecker reaction.

UNIT IV: Molecular orbital symmetry, frontier orbitals of ethylene, 1,3 Butadiene, 1,3,5-Hexatriene, allyl system, classification of pericyclic reactions FMO approach, Woodword-Hoffman correlation diagram method and perturbation of molecular (PMO) approach for the explanation of pericyclic reactions under thermal and photochemical conditions.

Electrocyclic reactions: Conrotatory and Disrotatory motions (4n) and (4n+2), allyl systems and secondary effects.Cycloadditions: Antrafacial and suprafacial additions, notation of cycloadditions and (4n+2) systems with a greater emphasis on (2+2) and

(4+4) –cycloadditions, (2+4) additions of ketones secondary effect of substitutes on the rates of cycloadditions and chelotropic reactions.

UNIT-V:FMO approach, Woodword–Hoffman correlation diagram method and perturbation of molecular orbital (PMO) approach for the explanation of sigma tropic rearrangements under thermal and photochemical conditions. Suprafacial and antrafacial shifts of H Sigmatropic shift involving carbon moieties, retention and inversion of configurations, (3,3) and (5,5) sigmatropic rearrangements detailed treatment of Claisen and Cope rearrangements fluxional tautomerism, Aza-Cope rearrangements and Barton reaction.

Books:

1. Advanced Organic Chemistry: Reactions Mechanisms and Structure by jerry March, Mc. Graw Hill and Kogakush,1992
2. Molecular reactions and Photochemistry by Charles Dupey and O. Chapman Prentice Hall.
3. Pericyclic reactions by S.N. Mukhuji, Mcmilan, pearson education, 1976

Reference Books:

1. Mechanisms and theory in Organic chemistry by T.H. Lowery and K.S. Rich gardson.
2. The modern structural theory in Organic chemistry by L.N. Ferguson, Preticesss Hall
3. Physical Organic chemistry by Jack Hine, Mc. Graw Hill

III SEMESTER

COURSE-302: Organic Spectroscopy – I

Unit – I: Infrared Spectroscopy: Units of frequency wave Length and wave number, molecular vibrations, factors influencing vibrational frequencies, the IR spectrometer, sampling techniques, characteristic frequencies of organic molecules and interpretation of spectra.

Unit – II: Ultraviolet spectroscopy:Introduction, the absorption laws, measurement of the spectrum, chromophores, standard works of reference, definitions, applications of UV spectroscopy to Conjugated dines, trienes, unsaturated carbonyl compounds and aromatic compounds.

Unit – III: Nuclear Magnetic Resonance Spectroscopy (Proton and Carbon – 13 NMR) The measurement of spectra: The chemical shift: the intensity of NMR signals and integration factors affecting the chemical shifts; spin-spin coupling to 13C 1H-1H first order coupling: some simple 1H-1H splitting patterns: the magnitude of 1H-1H coupling constants:

Unit – IV: Mass spectroscopy: Basic principles: instrumentation: the mass spectrometer, isotope abundances: the molecular ion, meta stable ions.

Unit V :Chromatographic techniques – Principles & applications with respect to Thin Layer chromatography, Paper chromatography and Column chromatography.

Text books:

1. spectroscopic Methods in Organic Chemistry. Forth Edition D.M. Williams and I. Flerning Tata – McGraw Hill, New Delhi, 1990.
2. Organic spectroscopy, Second Edition, W.Kemp, ELBS Macmillan, 1978 for ORD and CD and ESR.
3. Chromatographic techniques by STROTHERS
4. TLC Chromatography by STALL

Books in Reference:

1. Book 2 mentioned above.
2. Applications of absorption spectroscopy of Organic Compounds J.R. Dyer, Prentice Hali of India, New Delhi, 1984.
3. Spectrometric identification of Organic Compounds, Fourth Edition, R.M. Silverstein; G.C.Vasslellr and T.C. Merill, Johne Willey, Singapore, 1981.

III SEMESTER

COURSE-303: Organic Synthesis – I

UNIT- I:Formation of Carbon-Carbon single bounds: alkylations via enolate the enamine and related reactions, umplong (dipole inversion) reactions – the aldol reaction – applications of organo palladium, organo nickel and organo copper reagents ,applications of α-thiocarbonions, selenocarbonions and sulphur ylides, synthetic applications of carbenes and carbenoids.

UNIT- II: Formation of carbon-carbon double bonds: Elimination reactions Pyrolytic, syneliminations, sulphoxide-sulphonate rearrangement the witting reaction-alkenes from arylsulphonyl hydrazones, claisen rearrangement of allyl vinylethers.

UNIT- III: Methods of polymerization (a) addition polymerization (b) Condensation polymerization (c) Radical polymerizations (two examples of each method)

Reactions of unactivated carbon-hydrogen bonds: The HoffmannLieffier- Freytag rection-the Barton reaction-Photolysis of organic hypothalites.

UNIT- IV:Synthetic applications of organoboranes

Organoboranes: Preparation of Organobornaes viz hydroboration with BH3-THF, dicyclohexyl borane, disiamyl borane, thexyl borane, 9-BBN and diisopino camphenyl borane, functional group transformations of Organo boranes-Oxidation, protonolysis and rearrangements. Formation, of carbon of carbon-bonds viz organo boranes carbonylation, the cyanoborate process and reaction of alkenyl boranes and trialkenyl borates.

Unit V : Phase Transfer catalyst : Principle & applications of three catalysts : Tetra butyl ammonium bromide, Crown ethers, Ethyl Triphenyl Phosphonium Bromide.

Text Books:

1. some Modern Methods; of Organic Synthesis W. Carothers, Third Edition Cambridge University Press, Cambridge, 1988.
2. Organic synthesis. The disconnection approach, W. Warrant John Wiley & sons New York, 1984.

Books for Reference:

1. Modern synthetic Reactions, Herbet O. House, second Edition, W.A. Benzamine Inc. Menio Pak, Califormia, 1972.
2. Organic synthesis viz Boranes, Herbet C. Brown Gray, W. Kramer Alan B. Levy and M. Mark Midland john Wiely & Sons, New York, 1975

III SEMESTER
COURSE-304: ORGANIC NATURAL PROUDCTS- I

Study of isolation, stereochemistry, synthesis, biogenesis and biological properties of the following classes of natural products from plants, animal, and microbial sources and biopolymers.

Unit-I : Acetogenis and shkimates
Microbial metabolites : Penecillin -G, Cephalosphorin-C and Streptomycin

Unit-II Terpenes: Forskolin, Taxol and Azadirachtin

Unit-III : Alkaloids: Morphine, Reserpine and Vincristine

Unit-IV Biopolymers & Peptides:
α-Aminoacids, their general properties and synthesis, synthesis of peptides by Merrifield solid phase synthesis. Chemistry of Oxytocine and Dolostatin-10.

Unit V : Physical Properties, occurrence, Isolation , Structural elucidation and synthesis of Vitamin A, Vitamin E, Vitamin K.

Note: The scope of the topics of this unit i.e., Unit –IV is limited to the material contained in the books by Finar and Heathocok mentioned below

Reference Material:

1) Organic chemistry, Volume 2. Stereomistry and chemistry of Natural products I.L.Finar 5th Edition ELBS, 1975 (overall and for Unit I A ,Morphine and Unit IV)
2) Chemical aspects of Biosythesis, Johan Mann. Oxford University Press, Oxford 1996
3) Chemistry of Natural Products: A Unified approach N.R.Krishna Swamy, University press (INDIA) Ltd., Orient loangman limited. Hyderabad 1999 (overall and for certain aspects of Azadirachtin,Morphine , Reserpine)
4) Introduction to Organic Chemistry, A Streitwieser. CH Heathcock and E.M/Kosover IV edition , MC Milen 1992 (For Merrifield synthesis of peptides and also other aspects of Unit IV)
5) Primary literature for Unit IB Forskolin, Taxol , Azadirachtin Unit III (Minus morpine) and dolastatin-10. Details and copy of the relevant material are available with the Department of organic chemistry, FD and W Andhra University, Visakhapatnam.
6) Chemistry of Natural products By S V Bhat, B.A. Nagasampagi

COURSE-305: Lab-I Multi stage organic synthesis and chromatography techniques :

(a)Multistage Organic synthesis involving three or four stages (b)chromatographic techniques.

Books Suggested for Practicals:

Vogels text book of Practical Organic chemistry,V th edition by B.S.Furniss,A.J.Hanna ford, P.W.G. Smith and A.R.Tatchell, Pearson Education,1989

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ORGANIC CHEMISTRY SYLLABUS
IV SEMESTER

COURSE-401: Organic Reaction Mechanism-II and Organic Photochemistry

Unit I: Addition Elimination Mechanisms: (a) Addition to carbon multiple bonds- Addition reactions involving electrophiles, nucleophiles and free radicals, cyclic mechanisms, orientation and stereochemistry, hydrogenation of double and triple bonds, hydroboration, birch reduction. Michael reaction, addition of oxygen and N2O4 ; (b) Addition to carbon-hetero atom multiple bonds: Mannich reaction LAH reductions of Carbonyl compounds, acids, esters, nitrites, addition of Grignard reagents, Reformatsky reaction, Tollen"s reaction, Wittig reaction, Prins reaction (c) Elimination reactions: Stereochemistry of eliminations in acyclic systems, orientation in eliminations –Saytzeff and Hoffman elimination pyrolytic elimination.

Unit-II:Rearrangements: Classification and general mechanistic treatment of nucleophilic, freeradical and electrophilic rearrangements, Wangner- Meerwein and realated reactions, Tiffeman Demzanov rearrangement, α-Ketol rearrangement, Neber, Hofmann, BayerVilliger, Stevens ,Wittig rearrangements.

Unit III : Advanced organic named reactions with mechanisms : Baylis-Hillman reaction, Mitsunobu reaction, Pechmann condensation,Roush coupling, Shapiro reaction, Suzuki coupling.

Unit-IV:Organic photochemistry: Photochemical energy plank condon principle, Jablonski diagram singlet and triplet states, dissipation of photochemical energy, photosensitization, quenching, quantum efficiency and quantum yield.

Photochemistry of carbonyl compounds n-Q, Q- Q* transitions. Norrish type-I and Norrish type –II cleavages, Patterno-Buchi reaction.

Unit-V: Photochemistry of enone-Hydrogen abstraction, rearrangement of α,β-unsaturated ketones and cyclohexadienes, Photochemistry of P-Benzoquinones, photochemistry of unsatured systems-Olefines, cis,trans-Isimerisation and dimerisation hydrogen abstractions and addition acetylenes dimerisation, dienes-photochemistry of 1,3- butadienes (2+2) additions leading to cage structures photochemistry of cyclohexadienes.

Photochemistry of aromatic compounds – Excited state of benzene its 1,2-1,3-1,4 additions, photo Fries rearrangements , Photofries reactions of anilides, photosubstitution reactions of benzene derivatives.
Photochemistry of Pyridinium yields, pyrolysis of nitrites, esters and Barton reaction.

Books:

1) Advanced Organic chemistry: Reactions Mechanisms and structure by Jerry March, Mc. Graw Hill and Kogakush
2) Molecular reactions and Photochemstry by Charles Dupey and O.Chapman. Prentice Hall.

Reference Books:

1.Mechanisms and Theory in Organic chemistry by T.H. Lowery and K.S Rich gardson
2. The modern structure theory in Organic chemistry by L.N Ferguson, Pretice Hall
3.Physical Organic chemistry by Jack Hine, Mc.Graw Hill.

IV- SEMESTER
COURSE-402: ORGANIC SPECTROSCOPY II

UNIT I :

Optical Rotatory dispersion and circular dichrosim : phenomenon ORD and CD. Classification of ORD and CD curves; cotton effect curves and their application to stereochemical problems ; the octant rule and its application to alicyclic ketones.

Unit II

Improving the NMR spectrum : the mean,pulse experiment, new techniques in FTNMR spectroscopy: the separation of Chemical shift and coupling on to two different axes (2D-NMR, Cosy), spin decoupling, the nuclear over hauser effect associating the signal from directly bonded 13 C and 1H.
ESR derivative curves : Values and hyperfine splitting.

Unit III

Fragmentation processes; fragmentation associated with functional groups; rearrangement and mass spectra of some chemical classes.

Unit IV

Structural elucidation of Organic Compounds by a combined application of the special method of Units I-III.(UV,IR,NMR and Mass)

Unit V : Chromatographic techniques : principles and applications with respect to Gas Chromatography and HPLC with suitable examples & Chromatograms.

Books:

1. Spectroscopic methods in organic chemistry. Fourth edition D.M. Williams and I.
2. Fleming Tata-McGraw Hill, New Delhi, 1990. For all spectral methods except ORD and CD and ESR.
3. Organic Spectroscopy, second edition W.Kemp, ELBS Macmillan, 1987 for ORD and CD and ESR.

Reference Books:

1. Book 2 mentioned above
2. Applications of absorption spectroscopy of Organic compounds J.R. Dyer, Prentice Hall of India, New Delhi, 1984.
3. Spectroscopic identification of Organic compounds, Fourth Edition, R.M.silverstein; G.C.Vasslellr T.C Merill, Johne willey, Singapore, 1981. for ORD and CD “Applications of Optical rotation and circular Dichrosim”, G.C.Barret in “Elucidation of organic Structures by Physical and Chemical methods” Part I (Eds) K.W. Bentley and G.W.kirty john wiley,1972,Chapter VIII(only those aspects mentioned in the syllabus).

IV- SEMESTER
COURSE-403: ORGANIC SYNTHESIS –II

UNIT I :

Organo silanes : Synthetic applications of trimethyl silyl chloride dimethyl, t-butyl silyl chloride, trimethylsilyl cyanide, trimethyl silyl iodide and trimethyl silyl triflate, synthetic applications of α-silyl carbanion and β-silyl carbonium ions.

Unit II

Oxidation : Oxidation of hydrocarbons; alkenes,alcohols,aldehydes and ketones oxidative coupling reactions. Use of $Pb(OAC)_4$, NBS,CrO_3,SeO_2,MnO_2, Dialkoxy sulphonium ylides, $KMnO_4$, OsO_4, Per acids and Ti(III) Nitrate.

Unit III

Reduction : Catalytic hydrogenation (homogenous and heterogeneous), reduction by dissolving metals ,reduction by hydride transfer reagents, reduction with hydrazine and diamide, selectivity in reduction of nitoso and nitro compounds, reductive cleavage.

Unit IV

Disconnection approach: Introduction, Principle, Functional group inversion, Disconnection of mono cyclic substituted organic Compounds.

UNIT V : Design Organic Synthesis : Retro synthesis the disconnection approach –basic principles Convergent and linear synthesis with examples ; Retro synthesis of bi cyclic and tri cyclic systems

Books:

1) Some modern methods of organic synthesis by W.Carothers,IIIedition, Cambridge University Press, Cambridge 1988

2) Organic Synthesis : The Disconnection approach, S.Warrant John Wiley &Sons NewYork,1984

Reference Books:

1) Modern Synthetic Reactions,Herbet O.House,IInd Edition,W.A.Benzamine INC.Menio park, California,1972

2) Organic Synthesis viz Boranes, Herbet C.Brown Gray,W.Kramer Allan B Levy and M.Mark Midland John Wiley & Sons, New York 1975

IV SEMESTER

COURSE-404: Organic Natural Products- II and Biopolymers

Study of isolation, stereochemistry, synthesis, biogenesis and biological properties of the following classes of natural products from plants, animal, and microbial sources and biopolymers(unit I- Unit IV)

Unit-I Acetogenisns and shikimates:
Prostaglandin 15 R PGA 2 , Podophyllotoxin, Etoposide and Rotenone

Unit-II Terpenes and Steroids : Cholosterol, Progesterone and β-amyrin

Unit-III Alkaloids: Strychnine, Colchicine and Camptothecin

Unit-IV:Nucleic acids: Basic concepts of the structures of RNA and DNA and their hydrolysis products nucleotides, nucleosides and heterocyclic bases

Unit V : Coumarins : Classification, simple coumarins and their derivatives, isolation of Coumarins, Identification, Chemical methods of Degradation.

References:

1) Organic chemistry, Volume 2. Stereomistry and chemistry of Natural products I.L.Finar 5th Edition ELBS, 1975 (overall and for Unit I A ,Morphine and Unit IV)

2) Chemical aspects of Biosythesis, Johan Mann. Oxford University Press, Oxford 1996

3) Chemistry of Natural Products: A Unified approach N.R.Krishna Swamy, University press (INDIA) Ltd., Orient loangman limited. Hyderabad 1999(Overall and for certain aspects of rotenone , β-amyrin , strychnine, and colchicines)

Primary literature, for unit I, unit III and details and copy of the relevant material are available with the Department of organic chemistry FD&W Andhra University, Visahkapatnam.

Details of Primary literature :

Prostaglandin 15 R PGA 2 , Introduction “Biochemistry” D.E Metzier. AP, 1997,pp 705-707

Podophyllotoxin and Etoposide Chem. Revs 55.957,1955; 2.Photochemistry 54, 115-120,2000

Rotenone : Rodd, 2nd Ed IVE, p-257-68,1977.

Strychnine Alkaloids, Manske, Vol VIII , 1965, pp 592-672

Colchicine : Alkaloids, Manske,Vol.VIII,1984 pp1-62,Vol XI,1968 pp407-58 Vol II 1952 pp 261-330

Camptothecin:JACS, 1965,88,3888, Vol XXI,1983.pp 101-39

Chemistry of Natural products By S V Bhat, B.A. Nagasampagi

COURSE-405: Lab II: Organic Mixture Analysis and Estimations :

(a)Organic Mixture separation, Identification of functional groups and its derivatives
(b) Estimation of Glucose, sucrose, Phenol and Aniline.

Books Suggested for Practicals:

Vogels text book of Practical Organic chemistry,V th edition by B.S.Furniss,A.J.Hanna ford, P.W.G. Smith and A.R.Tatchell, Pearson Education,1989

MODEL QUESTION PAPER

M.A /M.Sc/M.Com/MCA/MLISc/M.Ed/B.Ed(MR)/DEGREE EXAMINATIONS

COURSE IN: _____

SEMESTER_____

PAPER No._____ & TITLE: _____

TIME: 3 Hrs Max Marks: 85

SECTION – A

Question No.1 is Compulsory

Answer ALL questions

Each answer shall not exceed one page or 200 words

1. (5 x 5 = 25) A.

B.

C.

D.

E.

SECTION – B

Answer ALL questions

Each answer shall not exceed five page or 1000 words

(5 x 12 = 60)

UNIT-I

2.

Or

3.

UNIT-II

4.

Or

5.

UNIT-III

6.

Or

7.

UNIT-IV

8.

Or

9.

UNIT-V

10.

Or

11.