Subject	BSCPHP 383	Physics Practicals VI	4	3	20	80	100	2
Group I Core Subject	BSCPHC 382	Electronics	3	3	20	80	100	2
Total number of Credits for Core Subject in VI Semester: 06								
Total number of Credits for Core Subject in I-VI Semesters: 28								

* Credits for Elective Papers will be considered for the entire B.Sc. Programme.

Note: The theory IA will be based on the average of two internal tests. The practical IA will be based on regular performance and one model test.

MANGALORE UNIVERSITY

B. Sc. CHOICE BASED CREDIT SYSTEM (2019-2020)

COURSE PATTERN AND SCHEME OF EXAMINATION

CORE SUBJECT: PHYSICS

Core/Elective	Course Code	Title	Instruction hrs/week	Duration of the Exam (hrs)	Max. Marks			Credits
					IA	Exam	Total	
I Semester								
Group I Core Subject	BSCPHC131	General Physics I	4	3	20	80	100	2
	BSCPHP 132	Physics Practicals I	3	3	10	40	50	1
Group II Elective	BSCPHCE 133	Basics of Radiation and Environment	2	2	10	40	50	1*
					Total number of Credits for Core Subject in I Semester: 04			
II Semester								
Group I Core Subject	BSCPHC 181	General Physics Paper II	4	3	20	80	100	2
	BSCPHP 182	Physics Practicals II	3	3	10	40	50	1
Group II Elective	BSCPHCE 183	Physics of Nano Science and Smart materials	2	2	10	40	50	1*
					Total number of Credits for Core Subject in II Semester: 04			
III Semester								
Group I Core Subject	BSCPHC 231	Optics	4	3	20	80	100	2
	BSCPHP 232	Physics Practicals III	3	3	10	40	50	1
Group II Elective	BSCPHCE 233	Electrical Appliances	2	2	10	40	50	1*
					Total number of Credits for Core Subject in III Semester: 04			
IV Semester								
Group I Core Subject	BSCPHC 281	Electricity &X-ray Crystallography	4	3	20	80	100	2
	BSCPHP 282	Physics Practicals IV	3	3	10	40	50	1
Group II Elective	BSCPHOE 283	Basics of Communication and Astronomy	2	2	10	40	50	1*
					Total number of Credits for Core Subject in IV Semester: 04			
V Semester								
Group I Core Subject	BSCPHC 331	Modern Physics	3	3	20	80	100	2
	BSCPHP 333	Physics Practicals V	4	3	20	80	100	2
Group I Core Subject	BSCPHC 332	Condensed Matter Physics	3	3	20	80	100	2
					Total number of Credits for Core Subject in V Semester: 06			
VI Semester								
Group I Core	BSCPHC 381	Nuclear Physics	3	3	20	80	100	2

SYLLABUS
FIFTH SEMESTER

CH 301 : Chemistry Paper V **3 Hrs / week (40 Hrs)**

UNIT I

Application of metal complexes and complexation : **3 Hrs**

Applications of complexes and complex formation in metallurgy, -Ag, Au, Al, Ni extractions. Volumetric analysis - Complexiometry, masking, demasking, external indicator.

Qualitative analysis - Test for Ferrous and Ferric ions, seperation of copper from Cadmium.

Gravimetric analysis - Presibitation of Nickel, Magnesium and Aluminium ions.

Thermodynamic and Kinetic Aspects of Metal Complexes **3 Hrs**

Thermodynamic stability of metal complexes (Brief outline), stepwise formation of complexes, stepwise formation and overall formation constants. Relation between K and β, $\Delta G = -2.303\ RT \log \beta$.

Factors affecting the stability - chelate effect, account for high ΔS values. Labile and inert nature of complexes. Substitution reactions of square planner complexes - Pt(II) complexes, syntheses of cis and trans $[Pt(NH_3)_2Cl_2]$ complexes, trans effect.

Magnetic Properties of Transition Metal Complexes **4 Hrs**

Origin of magnetism, magnetic Induction, magnetic flux density, magnetic moment per unit volume χ_M , χ_M^{corr}. Types of magnetic behaviour - dia, phara, Ferro magnetic and anti ferromagnetic properties - examples, cause (origin), magnetic susceptibility -data, sign, magnitude, temperature and field dependence.

Factor's determining para-magnetism, study of magnetic behaviour of first raw transition elements. Methods of determining magnetic susceptibility, Gouy's method, expression for μ_{eff}, and χ_M^{corr}. (no derivation) spin-only formula. Correlation of μ_s and μ_{eff}, values, $\mu_{eff} = \mu_s\ (1-\alpha \frac{\lambda}{\Delta})$. orbital contribution to magnetic moments, quenching of orbital angular moment. Application of magnetic moment data for 3d-metal complexes - predicting geometry of complexes.

SYLLABUS

FIFTH SEMESTER

CH-302 Chemistry Paper VI 3 Hrs / We

UNIT - I

Elementary Quantum Mechanics :

Quantum theory of radiation (Black-body radiation), Planck's radiation law, he solids, photoelectric effect, Compton effect, De-Broglie hypothesis, Heisenber principle, Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave eq and its importance, physical interpretation of the wave function, postulate mechanics (statements only), particle in a one dimensional box, setting of Sch equation for H-atom (no separations of variables or solutions), quantum numb importance.

Raman spectroscopy :

Classical and quantum theories of Raman effect. Concept of polarizability and ellipsoid. Rotational and vibrational Raman spectra, selection rules.

UNIT-II

Electronic spectra of Transition Metal Complexes :

Introduction , L-S coupling or R-S coupling. Term symbol, Micro states, ground states for d^{1-9} system, Terms generated by ligands. Electronic Spectra metal complexes,Types of d-d Transition,or crystal field transitions, Charge ligand to metal and metal to ligand, intraligand transitions, Selection rules for Spin selection rule, Laporte selection rule, relaxation of selection rule (vibronic multiplicity, forbidden transition, Orgel energy level diagram Explanations, Orge diagram for d^1 and d^9states,discussion of electronic spectra of [Ti (H_2O $(NH_3)_4$]SO_4 complexes.

Flame photometry.

General principle, instrumentation, interferences and applications.

Thermoanalytical methods : Principle, instrumentation and ap Thermogravimetric analysis, Derivative Thermpgravimetry and Differe Analysis. Nature of TGA, DTA & DTA curves

SYLLABUS VI SEMESTER

CH 351 : Chemistry Paper VII — **3 Hrs/ week (40 Hours)**

UNIT I

Inorganic Polymers : — **4 Hrs**

Preparation, properties, structure and applications of Silicones, Fluorocarbons and Phosphonitrilic halides. Production and structural features of borazine boron nitride, sulphur nitride (SN)x and silicon carbide.

Composites : — **2 Hrs**

Introduction, role of matrix in composites, types of matrix, different matrix materials, reinforcement, classification of composites and applications of composites in industry.

Synthetic Polymers : — **4 Hrs**

Types of polymerization (i) radical polymerization (ii) cationic polymerization and (iii) anionic polymerization. Zeigler-Natta polymerization. Phenol formaldehyde risins-e.g. Bakelite, urea-formaldehyde risins, epoxy resins and polyurethanes-preparation and applications. Natural rubber-composition. Synthetic rubbers: Buna-S and SBR-preparation and applications, advantages of synthetic rubbers over natural rubbers.

UNIT - II

Photochemistry : — **6 Hrs**

Interaction of radiation with matter, difference between thermal and photochemical processes. primary and secondary processes of a photochemical reaction, Laws of photochemistry : Grothus - Drapper law, Stark - Einstein law, (only statement) Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield defination, reasons for low and high quantum yield, one example for low quantum yield (combination of H_2 and Br_2) and one example for high yield (combination of H_2 and Cl_2), photosensitized reactions-energy transfer processes definition of photosensitisation. (e.g.: Photosynthesis in plants, dissociation of H_2, dissociation of ethylene, Isomerisation of 2-butene).

Radiation and Nuclear Chemistry : — **4 Hrs**

Radiolysis of water, radiation dosimetry, dosimeter, applications in organic and inorganic reactions. Application of radioisotopes in the study of oganic reaction mechanism, medicine and soil fertility. Industrial applications.

UNIT III

Carbohydrates : — **6 Hrs**

Monosaccharides : Interconversion of glucose and fructose, chain lengthening of aldoses. (Kiliani-Fischer method),Chain shortening (Ruff degradation), Conversion of glucose into mannose-epimerisation, Mechanism of osazone formation - Amadori rearrangement, Formation of glycosides, ethers (methyl), esters (acetates) Configuration of glucose and fructose-deduction. Determination of ring size of monosaccharides (methylation and periodic acid method). Elucidation of cyclic structure of D(+) glucose. Mechanism of mutarotation.

Amino Acids, Proteins and Peptides : 4 Hrs

Classification based on functional group, Essential and non essential aminoacids, structure and stereochemistry of amino acids- explanation, Acid-base behaviour, Isoelectric point and electrophoresis-explanation, Preparation of α amino acids from α halogenated acids, Strecker synthesis and Gabriel synthesis. Reactions due to COOH and NH_2 groups. Action of heat, structure and nomenclature of di-, tri- and polypeptides. Classification of proteins based on chemical composition and molecular shape. Peptide structure determination- end group analysis, selective hydrolysis of peptides, classical peptide synthesis, solid phase peptide synthesis, levels of protein structure-primary, secondary, tertiary and quaternary structures, Denaturation of protiens.

UNIT - IV

Structure and reactions of Carboxylic acids and their derivatieves : 5 Hrs

Structure of carboxylic acid and carboxylate ion, Effect of substituents on the acidity of aliphatic and aromatic carboxylic acids(ortho effect). Reactions of carboxylic acids, with mechanism-i) Homologation-Arndt-Eistert reaction ii) Degradation to alkyl halides-Hunsdiecker reaction iii) Conversion to primary amines-Curtius rearrangement iv) Conversion to haloacids-HVZ reaction. Derivatives of carboxylic acids- acid chlorides, amides, esters, anhydrides-preparation and reactions.

Alkaloids: 5 Hrs

Classification with examples-pyridine, piperidine, quinoline, isoquinoline and indole alkaloids. General properties-formation of salts and exhaustive methylation, physical properties and physiological activity. Structural elucidation of nicotine and Ephedrine including synthesis. Structural formulae of atropine, cocaine, hygrine and morphine.

CH 352 : Chemistry Paper VIII 3 Hrs/Week(40Hrs)

UNIT I

Colorimetry and Spectrophotometry : 4 Hrs

Introduction, theory of colorimetry and spectrophotometry. Beer-Lambert's law. Instrumentation and applications of colorimetry and spectrophotometry.

Ultraviolet (UV) absorption spectroscopy : 6 Hrs

Absorption laws -Beer-Lambert law, Concept of molar absorptivity, energy level, types of electronic excitations, Frank-Condon principle(explanation about red shift and blue shift), presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated dienes dienonesand, β-unsaturated carbonyl compounds.

UNIT - II

Nuclear magnetic resonance (NMR) Spectroscopy : 8 Hrs

Introduction, origin of spectra, instrumentation of PMR spectrometer, solvents used, scales, nuclear shielding and deshielding, number of signals obtained from the sample, position of signals and chemical shift and molecular structure, spin-spin splitting, spin notation and

MANGALORE UNIVERSITY

DEPARTMENT OF ENGLISH

SYLLABI FOR UNDERGRADUATE DEGREE PROGRAMMES

CHOICE BASED CREDIT SYSTEM

(Approved on December 7, 2018 BoS (UG), effective for batches commencing from 2019 onwards)

CORE COURSE IN ENGLISH

- CORE COURSE
- ELECTIVES

Paper I: EARLY ROMANTIC LITERATURE	ENCC101
Paper II: LATER ROMANTIC LITERATURE	ENCC102
Paper III: VICTORIAN LITERATURE	ENCC201
Pa Paper IV: SEVENTEENTH CENTURY LITERATURE	ENCC202
Paper V: SHAKESPEARE	ENCC301
Paper VI: THE TWENTIETH CENTURY	ENCC302
Paper VII: INDIAN WRITING IN ENGLISH	ENCC303
Paper VIII: AMERICAN LITERATURE	ENCC304

ELECTIVES:

History of English Language (Objective: Providing an expanded scope)	ENCE101
British Socio-political Movements (Objective: Supportive to the discipline of study)	ENCE102
Translation: Theory and Practice (Objective: Nurturing students' proficiency and skill)	ENCE201
INTRODUCTION TO POETRY (Objective: Enabling an exposure to a new discipline)	ENOE101

MANGALORE UNIVERSITY

SYLLABUS FOR B.Sc PHYSICS (OPTIONAL)

SCHEME OF INSTRUCTIONS AND EXAMINATIONS

Semester & Course code	Lectures Practicals (hours per week)	Duration of Exam (Hrs)	Max marks			Credits
			Marks for final Exam	Marks for I.A	Total Marks	
I Sem						
PHC 103	4	3	80	20	100	2
PHC 104 (Pract)	3	3	40	10	50	1
II Sem						
PHC 152	4	3	80	20	100	2
PHC 153 (Pract)	3	3	40	10	50	1
III Sem						
PHC 203	4	3	80	20	100	2
PHC 204 (Pract)	3	3	40	10	50	1
IV Sem						
PHC 253	4	3	80	20	100	2
PHC 254 (Pract)	3	3	40	10	50	1
V Sem						
PHC 307	3	3	80	20	100	2
PHC 308	3	3	80	20	100	2
PHC 309 (Pract.)	4	3	80	20	100	2
V Sem						
PHC 357	3	3	80	20	100	2
PHC 358	3	3	80	20	100	2
PHC 359 (Pract.)	4	3	80	20	100	2

Titles of theory papers with code

PHC 103 : General Physics I

PHC 152 : General Physics II

PHC 203 : Optics

PHC 253 : Electricity & X-ray Crystallography

PHC 307 : Modern Physics

PHC 308 : Condensed Matter Physics

PHC 357: Nuclear Physics

PHC : 358 : Electronics

Code Nos. Of Practical paper

PHC 104 : Practical I

PHC 153 : Practical II

PHC 204 : Practical III

PHC 254 : Practical IV

PHC 309 : Practical V

PHC 359 : Practical VI

Chairman
Departmental Council of Physics
Mangalore University
Mangalagangothri - 574 199