AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR (PUNJAB)

DESCRIPTION OF PROGRAMME OUTCOMES

NAME OF THE DEAPRTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc. (Nonmedical /Computer Science)

P.O. No.	***Description of Programme Outcome***	***Domain as per Bloom's Taxonomy***	***Level of Bloom Taxonomy****
PO-1	**Basic Scientific Knowledge:** Acquired the knowledge With facts and figures related to various subjects in pure sciences.	Cognitive	1,2,3,4,5,6

PO-2	**Communication skills:** Build the skills of speak, write, read and listen	Psychomotor	1,2,3
PO-3	**Ethics:** Adapt scientific conduct and ethical responsibilities.	Affective	1,2,3,4
PO-4	**Life-long learning:** Engaged in Life-long learning with changing environment and positive attitude**.**	Affective	1,2,3,4,5
PO-5	**Social Contribution and Social Responsibility:** Apply scientific theories and their relevancies in day to day life.	Affective	**4,5,6**
PO-6	**Team Work:** Execute the knowledge in various fields of science and work as a team**.**	Psychomotor	1,2,3,4
PO-7	**Personality development:** Accumulate, management, principles and apply these to develop overall	Affective	1,2

	personality**.**		
PO-8	**Leadership skills:** To cultivating a conductive environment, effective leadership quality and attributes to achieve the goals of organization**.**	Psychomotor	2,3,4
PO-9	**Problem solving skills:** Identify, analyze,evaluate and apply information scientifically to solve problems.	Affective	4,5,6
PO-10	**Environment, Sustainability and Diversity:** Develop flair by participating in various social and cultural activities voluntarily**.**	Cognitive	2,3
PO-11/ PSO1	**Critical thinking:** Working on the critical thinking and the scientific knowledge to design carryout, record and analyze the results of chemical reactions.	Cognitive	1,2,3,4,5,6
PO-12/PSO2	**Modern Tool Usage:** Learn the laboratory skills needed to design, safely and interpret different	Psychomotor	1,2,3,4,5,6

	instruments.		
PO-13/ *PSO3*	**Project management:** Demonstrate the knowledge of managing a project in multi disciplinary environment.	Cognitive	1,2,3,4,5,6
PO-14/ *PSO4*	**Employability skills:**Inculcate skills to excel in the fields of science, information technology and its related fields.	Psychomotor	1,2,3,4,5,6
PO-15/ PSO5	**Computing and technology**: Create ideas and solutions to existing problems in modern day issues with latest trends in computing.	Cognitive	1,2,3,4,5,6

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc-I (N.M.) Sem-I**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**:A.P.Ramanjeet Kaur**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Learn the de Broglie matter waves, Heisenberg uncertainty principle, atomic orbital, quantum numbers, aufbau and pauli exclusion principle.	Class test, Assignment-1
CO 2	Derive the Schrodinger wave equation, radial and angular wave functions, probability distribution curve, shapes of orbitals and electronic configuration of the elements and ions.	Class test, PPT
CO 3	Discuss the various periodic properties of elements along periods and groups.	Group discussion, Test

CO4	Know the chemistry of Noble gases, also discuss its preparation methods and chemical properties.	Oral test, Assignment-2
CO 5	Describe the covalent Bond- valance bond theory, types of hybridization and shapes of simple inorganic molecules and ions.	Group discussion, Assignment-3
CO6	Explain VSEPR theory and MO theory, homonuclear and heteronuclear, diatomic molecules, multicentre bonding in electro deficient molecule and electro negativity difference.	Board test, Notes

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc. -I (N.M.) Sem-II**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**:A.P.Ramanjeet Kaur**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Predict the structure and bonding in molecules / ions.	Class test, notes
CO 2	Explains the atomic, physical and chemical properties of alkali metals and alkaline earth metals	Assignment-1 , Discussion
CO 3	Recognizes the anomalous properties of Li and compares the properties Li with those other alkali metals preparation, properties and uses of compounds of sodium like sodium carbonate, sodium chloride, sodium hydroxide, sodium hydrogen carbonate, biological importance of sodium and potassium	Assignment-2 , PPT
CO4	Determine atomic, physical, chemical properties of group 13 elements	Group discussion, Viva
CO 5	Compare the group 14-17 elements and study the compounds like hydrides , oxides, oxyacids and halides of group 14-17.	Seminar by students, Test

CO6	Study the fullerenes, carbides, fluorocarbons, silicates, interhalogens compounds.	Class test, Assignment-3

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-III (N.M.) Sem -VI**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Understand concept of hard and soft acids- bases, the relation of hardness and softness with electronegativity.	Class test, quiz
CO2	Illustrate the importance of elements and metal ions in biological system, structure and functions of haemoglobin and myoglobin.	oral test, Seminar
CO3	Elaborate the biological role of alkali and alkaline earth metal ions with special reference to Ca^{+2}.	Assignment ,notes,PPT
CO4	Describe Silicones and Phosphazenes as examples of inorganic polymers and also discuss bonding in triphosphazenes.	Assignment, seminar, Discussion
CO5	Discuss nomenclature, classification, Preparation method, properties, bonding and applications of organometallic compounds.	Group discussion, class test
CO6	Understand the compounds of metal carbonyls, metal-ethylene complexes with suitable examples and the nature of bonding in metal carbonyls.	Viva, PPT

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc-II(N.M.) Sem-III**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**: A.P.Ramanjeet Kaur**

C.O. No.	**Description of Course Outcome**	**Method/s of Assessment**
CO1	Learn the chemistry of first transition series including: Characteristic and Properties of the elements of the first transition series	Class test, Notes
CO 2	Knowledge of simple compounds and complexes illustrating relative stability of their oxidation states and coordination number and geometry	Class test Group discussion

CO 3	Discuss about the chemistry of lanthanides(preparation methods, physical properties and its chemical properties).	Oral test
CO4	Describe the Chemistry of Elements of Second and Third Transition Series including: - General characteristics - comparative treatment with their 3d-analogues in respect of ionic radii	Assignment-1, Seminar by students
CO 5	Illustrate the chemistry of actinides with special reference to its chemical properties.	Group discussion, class test
CO6	Know how the isolation of lanthanides and actinides will be done.	Assignment-2

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc-II (N.M.) Sem-IV**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**:A.P.Ramanjeet Kaur**

C.O. No.	**Description of Course Outcome**	**Method/s of Assessment**
CO1	Know the key features of coordination compounds, including: - the variety of structures - oxidation numbers and electronic configurations - coordination numbers - ligands, chelates - bonding, stability of complexes - shape and structure	Class test, notes
CO 2	Knowledge about properties of oxidation and reduction.	assignment-1,Test
CO 3	Define Acids and Bases and distinguish between strong and weak acids and bases.	PPT
CO4	Illustrate the preparation of buffer solution and discuss its properties.	Notes, Discussion
CO 5	Describe the types of solvent and their general characteristics.	Group discussion, class test

CO6	Explain the reaction in non aqueous solvents with reference to liquid ammonia and liquid sulphur dioxide.	Assignment-2, Viva

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-III (N.M.) Sem -V**

NAME OF COURSE: **Inorganic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the concept of crystal field theory and crystal field splitting in tetrahedral and octahedral complexes. Illustrate the various factors affecting crystal field splitting.	Class test, quiz, Seminar
CO2	Gain the knowledge about the thermodynamic and kinetic stability of metal complexes and factors affecting the stability of complexes.	oral test, notes, Assignment
CO3	Elaborate the different substitution reactions of square planar complexes with examples.	PPT, Assignment
CO4	Discuss magnetic properties of different substances, methods of determining magnetic susceptibility and applications of magnetic moment data for 3d-metal complexes.	Assignment, seminar, Class test
CO5	Evaluate spin only magnetic moment for transition metal complexes.	Problem solving
CO6	Discuss types of electronic transitions, selection rules for d-d transitions and various applications of magnetic moment data for 3d-metal complexes.	Group discussion, viva, assignment

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-I (N.M.) Sem-I**

NAME OF COURSE: **Organic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Describe the various types of hybridization and chemical bonds; compare electromeric effect, resonance effect, field effect and inductive effect.	Class test, quiz
CO 2	Explain different types of reagents in organic reactions and methods of determination of reaction mechanism. Describe Reactive intermediates-carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (with examples).	Assignment

CO 3	Discussisomerism, preparation methods, physical properties and elaborate mechanism of various chemical reactions of alkanes.	Assignment
CO4	Study nomenclature, structure and chemical reactions of cycloalkanes.Explain Baeyer's strain theory and its limitations and evaluate ring strain.	Oral test, problem solving
CO 5	Formulate the preparation methods, physical properties and elaborate chemical reactions with mechanism.	Group discussion, class test
CO6	Appraise the methods of formation, structure, nomenclature of dienes and alkynes. Formulate the mechanism of electrophilic and nucleophilic reactions of alkynes.	Board test, exam

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-I (N.M.) Sem-II**

NAME OF COURSE: **Organic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	**Description of Course Outcome**	**Method/s of Assessment**
CO1	Describe the various types of Isomerism, Relative and absolute configuration, , chiral and achiral molecules, enantiomers, inversion, retention and racemization.	Class test, quiz
CO 2	Explain Conformational isomerism-conformational analysis of ethane and n-butane; conformations of cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives. Newman projection and Sawhorse formulae, Distinguish between configuration and conformation.	PPT,assignment
CO 3	DiscussNomenclature of benzene derivatives, aryl group. Structure of benzene: molecular formula and Kekule structure. stability, carbon-carbon bond lengths of benzene, resonance structure, MO picture.	Assignment
CO4	Study Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction of arenes. Energy profile diagrams. Activating and deactivating substituents of benzene derivatives.	Oral test, Seminar, assignment
CO 5	Explain Nomenclature and classification of alkyl halides, methods of formation,Mechanism of $S_N2$and S_N1 reactions with energy profile diagrams.	Group discussion, class test
CO6	Appraise the Methods of formation of aryl halides, nuclear and side chain reactions. Elaborate the mechanism of nucleophilic aromatic substitution reactions with examples. Compare the Relative reactivities of alkyl halides	Board test, Viva, Assignment

vs allyl, vinyl vs aryl halides.

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-II (N.M.) Sem-III**

NAME OF COURSE: **Organic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the various types of alcohols (monohydric, dihydric and trihydric), nomenclature, their methods of preparation and physical properties. Formulate the mechanism of their chemical reactions	Class test, quiz
CO2	Study nomenclature, structure, preparation methods and physical properties of phenols. Elaborate its chemical reactions with mechanism.	oral test, Seminar
CO3	Compare and contrast the acidic strength of alcohols, phenols and acids. Also explain the stability of phenoxide ion in phenols.	Assignment,notes, Class test

CO4	Describe the isomerism, nomenclature, preparation methods and physical properties of aldehydes. Also discuss their chemical reactions.	Assignment, seminar
CO5	Explainnomenclature, preparation methods and physical properties of ketones. Discuss its chemical reactionswith mechanism.	Group discussion, class test
CO6	Distinguish between aldehydes and ketones on the basis of chemical tests.Illustrate the use of acetals as a protecting group.	Viva, Assignment

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-II (N.M.) Sem-IV**

NAME OF COURSE: **Organic Chemistry**

NAME OF FACULTY**: Dr.Satwant Kaur Shahi**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Describe various types of carboxylic acids such as monocarboxylic, dicarboxylic and substituted carboxylic acids, their preparation methods, physical properties. Formulate various chemical properties with mechanism.	Class test, quiz, Discussion
CO2	Explain nomenclature, structure, preparation methods and chemical properties of carboxylic derivatives: acid chlorides, esters, amides and acid anhydrides.Elaborate mechanism of esterfication and hydrolysis reactions.	Assignment, Seminar
CO3	Discuss nomenclature, structure,methods of formation, physical and Chemical reactions of ethers and epoxides.	Assignment ,notes, Viva
CO4	Explain natural fats, edible and industrial oils of vegetable origin, common fatty acids, their use in soaps and detergents.	Assignment, PPT, Class test
CO5	Illustrate nomenclature, preparation, mechanism and properties of compounds of nitrogen and their reactions in acidic, neutral and alkaline media.	Group discussion, class test
CO6	Formulate structure, nomenclature, physical properties and chemical properties of amines.Discuss Stereochemistry of amines and Separation of primary, secondary and tertiary amines.	Viva, Class test

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-III (N.M.) Sem-V**

NAME OF COURS: O**rganic Chemistry**

NAME OF FACULTY**:A.P.Ramanjeet Kaur**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Knowledge about Nuclear magnetic resonance (NMR) spectroscopy.	Notes, Class test
CO 2	Understand the concept of Electromagnetic spectrum: Absorption Spectra	PPT

CO 3	Learn about theInfrared (IR) absorption spectroscopy	Notes and black board test
CO4	Evaluate the problem related to NMR,UV, IR.	problem solving, Assignment-1, Viva
CO 5	Describe the nomenclature, preparation, physical and chemical properties of Organometallic Compounds.	Group discussion, class test
CO6	Explain the nomenclature, preparation, physical and chemical properties of Organosulphur Compounds.	Assignment-2, Viva

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc. -III (N.M.) Sem-VI**

NAME OF COURS: O**rganic Chemistry**

NAME OF FACULTY**:A.P.Ramanjeet Kaur**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Learn the key features of heterocyclic compounds, its molecular orbital structure, methods of synthesis and chemical reaction with mechanism of electrophilic substitution and special reactions	Notes, Test, PPT
CO 2	Discuss the synthesis of polymers, its properties and uses.	Assignment-1, Viva
CO 3	Appraise the organic synthesis via enolates.	Demonstrate by experiment, Notes

CO4	Describe the classification, nomenclature, preparation, physical and chemical properties of Carbohydrates.	Assignment-2, Discussion, Viva
CO 5	Formulate the structure of ribose and deoxyribose.	PPT, Test
CO6	Explain the classification, structure and stereochemistry of amino acids,proteins, peptides and nucleic acids.	Seminar by Students, Test

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME:**B.Sc.-I (N.M.) Sem-I**

NAME OF COURSE:**Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Know the basic mathematical concepts like differentiation, integration ,curve sketching ,probability ,permutation ,combination. Evaluation of slopes of curves.	Class test, quiz
CO 2	Evaluation of analytical data, different types of errors (determinate and non determinate errors)	oral test, problem solving
CO 3	Discuss about liquid state and the different types of liquid crystals, thermography and seven segment cell.).Know the structural differences between solid, liquid and liquid crystals.	Assignment ,notes, PPT

CO4	Explain about gaseous state and the postulates of kinetic theory, different molecular speeds and Maxwells distribution of molecular speeds.	Group discussion , seminar
CO 5	Formulate the various gaseous laws, ideal gas equation, vander waals equation of real gases and law of corresponding states.	Assignment, class test
CO6	Describe the various physical properties, optical activity, dipole moment, structure of molecules. Explain magnetic properties of molecules.	Viva, Seminar,test

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME:**B.Sc.-I (N.M.) Sem-II**

NAME OF COURSE:**Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the Ideal and non ideal solutions, various methods of expressing concentration of solution, activity and activity coefficients,Raoult's Law.	Class test, quiz
CO 2	Explain dilute solutions. Elaborate the various Colligative properties of dilute solutions with their experimental methods for determination.	Assignment , oral test
CO 3	Describe colloidal state, classification of colloids, stability of colloids and various applications of colloids. Discuss Emulsions and its properties.	Notes,Discussion.ppt
CO4	Know the basic concept of Chemical kinetics, various factors affecting the rate of reaction. Discuss reactions of first, second, higher orderand rate law expression for them.	Group discussion , seminar, test
CO 5	Discuss various theories of chemical kinetics, Arrhenius equation, effect of temperature on rate of reaction, Collision theory and its thermodynamic aspects.	Assignment, class test
CO6	Illustrate the general characteristics of Catalytic reactions, Enzyme Catalysis and Michaelis Menten equation for enzyme catalysis and its mechanism.	Viva, test, seminar

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME:**B.Sc.-II (N.M.) Sem-III**

NAME OF COURSE:**Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Know the basic concept of thermodynamics terms: system, surroundings. First Law of Thermodynamics: statement, definition of internal energy and enthalpy.	Assignment , quiz

CO 2	Derive the expression for the work done in various thermodynamic processes. Explain Joules law, Joule Thomson coefficient and inversion temperature of different gases.	oral test,Seminar
CO 3	Illustrate the importance of 2nd law of thermodynamics need for the law, different statements of the law.	Class test ,notes, PPT
CO4	Appraise Carnot cycle and its efficiency, Carnot theorem and thermodynamic scale of temperature.	Group discussion , seminar
CO 5	Explain third law of thermodynamics, Nernst heat theorem, various criteria for equilibrium, spontaneity and concept of residual entropy.	Assignment, class test
CO6	Discuss Chemical Equilibrium, Equilibrium constant and free energy, Thermodynamic derivation of law of mass action, Le Chatelier's principle.	Viva, Notes

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-II (N.M.) Sem-IV**

NAME OF COURSE: **Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Explain the meaning of term phase, component and degree of freedom. Discuss Phase equilibria of two component systems -solid liquid equilibria, Nernst distribution law and its applications.	Class test , quiz
CO 2	Discuss Freezing mixtures, Partially miscible liquids, Nernst distribution law, thermodynamic derivation and its application**.**	oral test, problem solving
CO 3	Understand some basic terms related to electrochemistry, Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations,different theories of dissociation of electrolytes, dilution law, its uses and limitations.	Class test,notes

CO4	Study transport number, application of conductance measurements and conductometric titrations.	Group discussion, seminar
CO 5	Explain different types of reversible electrodes, EMF of cell and its measurements, definition of pH, Buffer, Henderson-Hazel equation, Corrosion and its different theories.	Assignment, class test
CO6	Describe various Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient potentiometric titrations. Debye-Huckel-Onsagar's equation for strong electrolytes.	Viva, Notes, test

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-III (N.M.) Sem-V**

NAME OF COURSE: **Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the basic concepts of quantum mechanics (black body radiations, photoelectric effect and Planck Radiation Law).	Assignment , quiz
CO 2	Derive Schrodinger wave equation for H atom and particle in 1 dimensional box. Also obtain expression for various physical quantities.	Exam, oral test
CO 3	Illustrate the importance of wave function and quantum numbers. Explain the various characteristics of wave function.	Class test,notes
CO4	Explain the rotational spectra of diatomic molecules and the effect of isotope on the rotational spectrum.	Group discussion , assignment
CO 5	Discuss infrared spectrum ,energy levels of harmonic oscillator and the concept of vibration frequencies of different functional groups	seminar, class test
CO6	Describe the Rotational-Vibrational spectra of molecules and the selection rules for the spectra.	Viva, exam

DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**: Physical Sciences**

NAME OF THE PROGRAMME: **B.Sc.-III (N.M.) Sem-VI**

NAME OF COURSE: **Physical Chemistry**

NAME OF FACULTY**: A.P.Himani Saini**

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Understand the concept of polarizability,pure rotational and pure vibrational Raman spectra of diatomic molecules, selections rules.	Assignment , quiz
CO 2	Discuss the concept of potential energy curves,qualitative description of selection rules and Franck-Condon principle.	oral test, Seminar
CO 3	Explain space lattice and unit cell. Laws of crystallography-(i) Law of constancy of interfacial angles. (ii) Law of rationality of indices (iii) Law of symmetry elements in crystals.	Class test, notes, PPT

CO4	Know about the space lattice and unit cell,X ray diffraction of various crystals,Derivation of Bragg's equation.Explain the band structure of solids and determine the electrical properties.	Group discussion , assignment
CO 5	Discuss the interaction of radiations with matter, various Laws of photochemistry: Grothus-Drapperlaw, Stark-Einstein law, photosensitized reactions and energy transfer processes.	seminar, class test
CO6	Describe Jablonski diagram (radiative and non radiative processes),the basic concept of Laser and Maser. Photochemistry of vision and colour	Test , ppt

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE PROGRAM : B.Sc (NM/CA) 2nd (4th SEM)

NAME OF THE COURSE : (English)

NAME OF FACULTY : Mandeep Kaur (ASST. PROF.)

CO	Description of Course Outcomes	Method/s of Assessment

No.		
CO 1	Apply fundamentals of critical thinking reading writing and communicating.	MST, Class tests, Class Assignment.
CO 2	Develop critical creative thinking skills that will make students enable to write essays and differentiate between objective and subjective writing.	MST, Seminar, Class Assignment, Class tests.
CO 3	Designing letters for formal and informal communication.	MST, Seminar, Class assignments, class tests,
CO 4	Apply the LSRW skills.	MST, Seminar, GD.
CO 5	Practise English grammar to aware the students about the correct usage of it.	MST, Participation in class, Class assignments, Class tests.
CO 6	Develop the fluency of language, presentation skills and creative writing.	MST, Participation in class, Class assignments, Class tests.

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE PROGRAM : BSc. (NM/CA)-2nd(3RD SEM)

NAME OF THE COURSE : (English)

NAME OF FACULTY : Mandeep Kaur (ASST. PROF.)

CO No.	Description of Course Outcomes	Method/s of Assessment
CO 1	Compare and contrast between the different genres of plays that will help the students to learn the structure of full length play and one act play.	MST, Class tests, Class Assignment.
CO 2	Explain major themes of plays that will make students capable to raise significant question, to enhance their creative expressions and reach well reasoned conclusion.	MST, Seminar, Class Assignment, Class tests.
CO 3	Apply the LSRW skills.	MST, Class assignments, class tests.
CO 4	Apply fundamentals of critical thinking reading writing and communicating.	MST, Seminar, GD.
CO 5	Analyze the role of literature as the means of reflecting and shaping thought and behavior.	MST, Participation in class, Class assignments, Class tests.
CO 6	Demonstrate the ability to discuss the literature using relevant support from the text.	MST, Participation in class, Class assignments, Class tests.

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE, BELA RUPNAGAR PUNJAB
MAPPING OF PROGRAM OUTCOME VERSUS COURSE OUTCOME
INTERNAL QUALITY ASSURANCE CELL

NAME OF DEPARTMENT- PHYSICAL SCIENCES

NAME OF PROGRAMME-B.Sc-III(NM/CA)

NAME OF COURSES -CONDENSED MATTER PHYSICS,ELECTRONICS,NCLESR AND RADIATION PHYSICS,INORGANIC,ORGANIC,PHYSICAL

CORRELATION LEVEL:1,2, and 3;1-SLIGHT (LOW); 2-MODERATE (MEDIUM) 3- HIGH | MENTION GAP ANALYSIS AT THE END

S.NO	Year	Semester	Name of Course/Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
1			PHYSICS-A (CONDENSED MATTER PHYSICS)	CO1	3	2	1	2	2	2	1	1	2	2	2	1	1	2	3
				CO2	3	2	2	2	3	2	2	1	2	2	3	2	2	3	3
				C03	2	3	1	2	1	2	2	2	3	2	3	2	1	3	2
				CO4	3	2	2	3	2	3	2	3	2	2	3	2	1	2	3
				CO5	2	3	1	3	2	2	2	2	3	2	2	3	2	1	2
				CO6	3	1	1	2	3	3	2	1	2	2	3	2	2	1	2

2			PHYSICS-B (ELECTRONICS)	CO1	3	2	1	2	3	2	1	1	2	2	3	1	2	2	1
				CO2	2	2	2	2	3	1	2	1	2	2	2	2	1	1	1
				C03	2	3	1	2	2	1	2	2	3	2	3	3	2	2	2
				CO4	3	2	1	3	2	2	1	2	3	2	3	2	1	1	1
				CO5	2	3	2	2	2	1	2	1	2	2	2	2	1	1	2
				CO6	2	3	2	1	1	1	2	1	3	2	2	1	2	1	2
3			PHYSICS-C (NUCLESR AND RADIATION PHYSICS)	CO1	3	2	3	1	2	2	1	2	3	2	2	1	2	3	2
				CO2	3	2	2	2	1	1	2	2	3	2	3	2	1	2	3
				C03	2	3	2	1	2	2	3	2	2	2	2	2	1	3	2
				CO4	2	1	1	2	2	2	1	3	2	2	3	2	2	3	2
				CO5	2	3	1	1	2	1	2	3	2	2	2	3	2	1	2
				CO6	3	2	2	1	2	2	3	2	3	2	3	2	1	2	2
4			CHEMISTRY-A (INORGANIC)	CO1	3	3	2	2	1	2	1	2	3	2	2	1	1	3	3
				CO2	2	2	1	3	2	2	1	2	3	2	2	2	1	2	3
				C03	2	1	1	3	2	3	2	1	1	2	2	1	1	2	1
				CO4	2	2	1	3	1	2	1	1	2	2	2	2	1	1	1
				CO5	3	3	1	3	1	2	2	1	2	2	1	1	2	2	1
				CO6	2	1	1	2	1	2	2	2	2	2	2	1	1	2	2
5			CHEMISTRY-B (ORGANIC)	CO1	2	1	2	3	1	2	1	2	3	2	1	2	1	1	1
				CO2	3	2	1	3	2	1	1	1	3	2	1	1	1	1	1
				C03	2	2	2	2	3	1	1	2	2	2	1	1	2	1	1
				CO4	3	1	1	3	2	1	1	2	1	2	2	1	1	1	1
				CO5	3	1	2	3	1	2	2	1	2	2	1	1	1	1	1
				CO6	3	2	2	3	2	2	3	2	2	2	1	1	2	2	1
6			CHEMISTRY-C (PHYSICAL)	CO1	3	2	2	3	2	2	1	1	1	2	2	1	1	2	1
				CO2	3	2	2	3	2	1	1	1	2	2	3	1	1	1	1
				C03	2	1	2	3	1	1	2	2	3	2	3	1	2	2	2
				CO4	3	1	2	3	1	2	2	1	3	2	3	1	1	1	1

				CO5	3	2	2	2	2	1	2	2	2	2	3	2	1	1	2
				CO6	3	2	1	3	3	1	3	2	1	2	3	1	1	1	2
7			MATHEMATICS-A (DISCRETE MATHEMATICS)	CO1	2	1		1	2		1		3		2	3		1	
				CO2	1	3		1	1		1		3		2	3		1	
				C03	1	2			1				3	3		3	3		3
				CO4	2	1		2					3		2	3	1	1	
				CO5	2	1		1	1		1		3		2	3		1	
				CO6	2	1		1	1		1		3		2	3		1	
8			MATHEMATICS-B (ALGEBRA 1)	CO1	1	1		1	2		1		3		2	3		1	
				CO2	2	2	2	1	1		1		3		2	3		1	2
				C03	1	2			1				3			3			
				CO4	2	1	2	2		2			3	2	2	3	1	1	
				CO5	2	1		1	1		1		3		2	3		1	
				CO6	2	1		1	1		1		3		2	3		1	
9			MATHEMAICS-C (MATHEMATICAL METHOD)	CO1	2	1		1	2		1		3		2	3		1	1
				CO2	1	3		1	1		1		3		2	3		1	
				C03	1	2			1				3	3		3	3		3
				CO4	2	1		2					3		2	3	1	1	
				CO5	2	1		1	1		1		3		2	3		2	
				CO6	2	1		1	1		1		3		2	3		1	
10			PUNJABI (COMPULSARY/ MUDLA GYAN)	CO1		1	1	1	1		1		1	1	1				
				CO2	1		1	1	1		1		1	2	1				
				C03		2			1		1	1		2	1				
				CO4		2			1		1	1		2	1				
				CO5		1	1							1					
				CO6		1	1							2					
11			COMPUTER	CO1	1			3			1		1			1		2	3
				CO2	1			3			1		1			1		2	3

				CO3	1			3			1		1			1		2	3
				CO4	1			3			1		2		1	1	1	2	3
				CO5	1			3	2	3	1	2	3		1	1	3	2	3
				CO6	1			3			1		1		2	1		2	3

Attainment of PO by Direct Method

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE, ROPAR PUNJAB

INTERNAL QUALITY ASSURANCE CELL

PROGRAMME: BSC-I(N.M./CS)	SEMESTER:-II	YEAR:2018-19	DATE OF DECLARATION OF RESULT BY UNIVERSITY

S. NO.	NAME OF STUDENT	CLASS R. NO.	UNIVERSITY REGISTRATION NO.	SUBJECT 1(NAME AND COURSE CODE)	SUBJECT 2	SUBJECT3	SUBJECT 4	SUBJECT 5	TOTAL OF ALL SUBJECTS /COURSES	%age/ CGPA
1										
2										

	Theory			Practical	Internal			TOTAL (T+I+P)	Theory			Practical	Internal				TOTAL (T+I+P)	Theory			Internal			TOTAL (T+I)	Theory	Practical	Internal	TOTAL (T+I)	TOTAL OF ALL SUBJECTS /COURSES	%age/ CGPA	ATAINMENT LEVEL
	Paper-A	Paper-B	Paper-C		Paper-A	Paper-B	Paper-C		Paper-A	Paper-B	Paper-C		Paper-A	Paper-B	Paper-C	Practical		Paper-A	Paper-B	Paper-C	Paper-A	Paper-B	Paper-C		COMPUTER		COMPUTER		Punjabi	Punjabi				

3	Ravneet Kaur	1202	13101	814-16-251	20	15	17	40	9	9	8	118	25	17	22	19	10	10	10	8	121	16	18	21	12	13	13	93					52	24	76	408	74.18	3
4	Harmeet Kaur	1205	13102	814-16-252	17	14	16	35	7	7	8	104	17	11	25	18	10	9	10	8	107	13	22	15	13	13	13	89					51	23	74	374	68	3
5	Suman Bala	1207	13103	814-16-253	18	14	16	40	8	9	9	114	21	14	25	19	10	10	10	8	117	8	17	16	13	13	13	80					50	24	74	385	70	3
6	Amandeep Kaur	1208	13105	814-16-255	22	15	17	40	8	8	8	118	26	17	25	20	9	10	9	7	124	4	16	13	13	13	13	–					50	23	73	387	70.3	3
7	Jaswinder Kaur	1209	13106	814-16-256	19	14	17	37	8	8	8	111	18	13	26	19	9	9	9	7	110	0	24	14	13	13	13	77					47	24	71	369	67	3

8	Harleen Oberoi	12011	131107	814-14-360	19	13	16	38	6	6	6	102	15	8	24	20	9	9	8	7	100	0	20	18	AW	AW	AW	–					45	23	68	308	56	2
9	Pallavi Rani	12044	131108	814-16-257	22	17	16	40	8	8	8	119	20	15	24	21	10	10	10	8	118	19	25	14	13	13	12	96					49	23	72	405	73.6	3
10	Ravinder Singh	12556	131112	814-16-261	9	13	12	35	6	6	6	87	17	5	24	18	9	9	9	7	98	0	20	18	12	11	11	72					35	20	55	312	56.7	2
11	Navneet Menon	12553	131113	814-16-262	12	13	11	37	6	6	6	91	18	11	17	16	9	9	9	7	96	28	17	17	12	11	11	96					38	21	59	342	62.18	3
2	Gurdeep Singh	12557	131114	814-16-267	9	13	9	33	6	6	6	82	20	6	14	17	8	8	8	8	88	13	13	AW	12	11	11	–					31	21	52	282	51.2	2
1	M	1	13	814	1	1	1	33	6	6	6	8	17	5	1	16	10	1	1	8	9	1	1	1	1	1	1	7					2	2	4	301	54	2

3	anpreetKaur	254	115	-16-268	2	1	1					5			9			0	0		5	4	0	6	2	1	1	4					7	0	9		.7	
14	SatnamSingh	12552	13116	814-16-263	17	12	9	35	6	6	6	91	11	11	15	17	9	9	9	8	89	15	10	13	12	11	11	72					34	20	54	306	55.6	2
15	Vishal	12555	13119	814-16-266	10	11	8	34	6	6	6	81	19	3	20	16	9	9	9	7	92	14	14	16	12	11	11	78					29	20	49	300	54.5	2
16	DaljeetKaur	33011	13131	814-16-345									24	17	24	21	10	10	10	8	124	25	24	25	13	13	13	113	30	38	14	82	46	24	70	389	77.8	3
17	AvneetKaur	33022	13132	814-16-346									20	11	26	16	9	9	9	8	108	15	13	10	12	12	12	74	32	36	13	81	48	23	71	334	66.8	3
18	Simranj	33033	13133	814-16-347									22	13	22	18	9	9	10	8	111	14	15	19	13	13	13	87	32	37	14	83	44	23	67	348	69.6	3

	eet Kaur																																					
19	Simranjeet Kaur	3304	13134	814-16-348									25	16	26	19	9	10	10	7	122	18	23	22	13	13	13	102	30	38	14	82	55	23	78	384	76.8	3
20	Amit Kumar	3353	13135	814-16-349									21	9	21	19	9	9	9	7	104	3	2	3	12	11	11	–	26	34	13	73	30	21	51	268	53.6	2
21	Harvir Singh	3352	13137	814-16-351									19	11	20	18	9	9	9	7	102	5	4	13	12	11	11	–	26	32	12	70	27	21	48	276	55.2	2
22	Sandeep Kumar	3354	13139	814-16-353									16	9	11	17	9	9	9	7	87	3	3	14	12	11	11	–	24	32	13	68	27	20	47	256	51.2	2

23	Shamsher Singh	3351	13142	814-16-511									16	10	12	17	8	8	8	7	86	1	4	11	12	11	11	–	27	32	12	71	27	21	48	255	51	2
24	Harjeet Kaur	1206	13144	8118-16-162	18	15	12	35	8	8	8	104	14	13	20	18	10	10	9	7	101	12	10	16	AW	AW	AW	–					38	23	61	291	52.9	2
	Simranjeet Kaur	1203	13145	8118-16-166	18	19	17	38	9	8	8	117	19	15	21	19	10	10	10	8	112	15	22	16	12	12	12	89					51	23	74	392	78.4	3
	Harpreet Singh	1251	13146	811-13-335	10	18	14	35	5	6	6	94	16	13	19	19	8	8	8	7	98	4	10	18	12	11	11	–					49	20	69	327	61.2	3
				AVERAGE								95.17									100.4							51.68				67.77			60.4	333.29	62.85	

Average attainment of PO by direct Method= 62.85%

Attainment of PO by Indirect Method

POs	DEGREE OF RELEVANCE					*% of PO	Level of attainment
	No. of 1	No. of 2	No. of 3	No. of 4	No. of 5		
1				84	15	75	Level of attainment
2			6	56	40	85	Level 3
3			9	60	30	82.5	Level 3
4				88	10	81.6	Level 3
5			3	52	50	87.5	Level 3
6			3	40	65	90	Level 3
7			3	44	60	89.1	Level 3
8			3	76	20	82.5	Level 3
9			12	20	90	101.6	Level 3
10		6	42	16	15	65.8	Level 3

Average attainment of PO by indirect method= 74.56%

Total PO attainment (%) = (weightage: 80 %) X (Average attainment in direct method) + (weightage: 20 %) X (Average attainment in indirect method)

= (80%) X 62.85 + (20%) X 74.56

= **65.19 %**

Level of Attainment = **Level 3**