

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF CHEMISTRY
SEMESTER-I
COURSE 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL
SCIENCES

Course Outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
- 5 To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF CHEMISTRY
SEMESTER-I
COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
4. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health.
5. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
6. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite).

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF CHEMISTRY
SEMESTER-II
COURSE 3: GENERAL AND INORGANIC CHEMISTRY

Course Outcomes:

At the end of the course the student will be able to:

1. Understand the structure of atom and the arrangement of elements in the periodic table.
2. Understand the nature and properties of ionic compounds.
3. Identify the structure of a given inorganic compound.
4. Explain the existence of special types of compounds through weak chemical forces.
5. Define acids and bases and predict the nature of salts

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SEMESTER-II
COURSE 4: GENERAL AND INORGANIC CHEMISTRY

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the basic concepts of p-block elements.
2. Explain the concepts of d-block elements
3. Distinguish lanthanides and actinides.
4. Describe the importance of radioactivity

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DEPARTMENT OF CHEMISTRY
SEMESTER-III
COURSE 5: FUNDAMENTALS IN ORGANIC CHEMISTRY

Course Outcomes:

At the end of SEMESTER, the student will be able to

1. Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.
2. Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
3. Learn and identify many organic reaction mechanisms.
4. Correlate and describe the stereo-chemical properties of organic compounds and reactions.

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DEPARTMENT OF CHEMISTRY
SEMESTER-III
COURSE 6: ORGANIC CHEMISTRY

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the concept of SN1 and SN2 and SNi mechanisms.
2. Describe the reactivity of alcohols and phenols.
3. Achieve the skills required to propose various mechanisms
4. Apply the concepts for synthesizing various oxygen containing organic compounds
5. Interconvert the monosaccharides.

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DEPARTMENT OF CHEMISTRY
SEMESTER-III
COURSE 7: PHYSICAL CHEMISTRY - I

Course Outcomes:

At the end of the SEMESTER the student will be able to:

1. Understand the ideal and non-ideal behavior of solutions.
2. Determine the molecular mass of non-volatile solutes.
3. Discuss the basic concepts of Photochemistry.
4. Apply the principles of electrical conductivity.
5. Explain the importance of emf and its applications.

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DEPARTMENT OF CHEMISTRY
SEMESTER-III
COURSE 8: INORGANIC AND PHYSICAL CHEMISTRY

Course Outcomes:

At the end of the SEMESTER the student will be able to:

- 1) Apply IUPAC nomenclature for Coordination compounds
- 2) Understand the various theories, structure and stereo chemistry of coordination compounds.
- 3) Explain the reaction mechanism in complexes.
- 4) Apply the 18-electron rule.
- 5) Discuss the basic concepts of thermodynamics.

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DEPARTMENT OF CHEMISTRY
SEMESTER-IV
COURSE 9: PHYSICAL CHEMISTRY - II

Course Outcomes:

At the end of the SEMESTER the student will be able to:

1. Explain the difference between solids liquids and gases in terms of intermolecular interactions.
2. Differentiate ideal and real gases.
3. Discuss the basic concepts of two component systems
4. Apply the concepts of adsorption.
5. Understand the basic concepts of crystallography.

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DEPARTMENT OF CHEMISTRY
SEMESTER-IV
COURSE 10: GENERAL AND PHYSICAL CHEMISTRY

Course Outcomes:

At the end of the SEMESTER the student will be able to:

1. Correlate and describe the stereochemical properties of organic compounds.
2. Explain the biological significance of various elements present in the human body.
3. Apply the concepts of ionic equilibrium for the qualitative and quantitative analysis.
4. Determine the order of a chemical reaction.
5. Describe the basic concepts of enzyme catalysis.

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SEMESTER-IV
COURSE 11: Nitrogen containing Organic Compounds & Spectroscopy

Course Outcomes:

At the end of the SEMESTER the student will be able to:

1. Distinguish primary secondary and tertiary amines and their properties.
2. Describe the preparation and properties of amino acids.
3. Explain the reactivity of nitro hydrocarbons.
4. Discuss heterocyclic compounds with N, O and S.
5. Apply the concepts of UV and IR to ascertain the functional group in an organic compound.


CO-ORDINATOR
IQAC
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