VISVODAYA GOVT DEGREE COLLEGE

VENKATAGIRI

DEPARTMENT OF CHEMISTRY

PROGRAMME OUTCOMES & COURSE OUTCOMES

Andhra Pradesh State Council of Higher Education

B.Sc. Chemistry Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

PROGRAMME OUTCOMES

- Develop observation and critical thinking
- Understand scientific methods
- Scientific reasoning and analytical problem solving with a molecular perspective

PROGRAMME SPECIFIC OUTCOMES

- Develops knowledge about all the branches of Chemistry such as organic, inorganic, physical and medicinal chemistry
- Gain the practical knowledge about elements and their reactivity
- Handling of chemicals
- Get exposure of experimental techniques and instruments
- Inspires to pursue higher education in Chemistry and its interdisciplinary courses
- Inspires to become a good researcher/chemist/scientist
- Learn skills required to get a job in pharmaceutical, bioprocessing and petroleum industries

COURSE OUTCOMES

SEMESTER I

COURSE 1: INORGANIC & ORGANIC CHEMISTRY (1304CHE15)

Theory:

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

- Gets knowledge about p-block elements
- Acquires knowledge about basic concepts of organic chemistry
- Understands the concept of Aromaticity, Huckel's rule

Laboratory:

1304CHE15: Practical-I Simple Salt Anaiysis

On successful completion of this course, the students shall be able to:

- Develop skills required for the qualitative analysis of simple salt containing one anion and cation

SEMESTER II

COURSE II : PHYSICAL & GENERAL CHEMISTRY (2304CHE15)

Theory:

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

- Understands the basic terminology of stereochemistry and molecular representations
- Gets knowledge about the states of matter in depth and properties of solutions
- Acquires knowledge about hybridization, valence bond theory and molecular orbital theory
- Learn about the properties of colloids, sols, emulsions and gels

Laboratory:

2304CHE15: Practical-II Analysis of Mixture Salt

On successful completion of this course, the students shall be able to:

- Use glassware , equipment and chemicals and follow experimental procedures in the laboratory
- Develop skills required for the qualitative analysis of mixture salt containing two anions and two cations

SEMESTER III

COURSE III : INORGANIC CHEMISTRY & ORGANIC CHEMISTRY (3304CHE15)

Theory:

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

- Develops insight into Chemistry of d-block and f-block elements
- Develops in-depth knowledge about metal carbonyls and EAN (Effective atomic number)
- Learn about various name reactions and their mechanisms

Laboratory:

3304CHE15: Practical-III Titrimetric analysis and Organic Functional Group Reactions

On successful completion of this course, the students shall be able to:

- How to use glassware equipments and chemicals and follow experimental procedures in the laboratory
- Identifies the nature of functional group present in a given organic compound
- Determine the amount of Fe(II)/Cu(II) through titrimetric analysis
- How to depose of chemicals in a safe and responsible manner
- How to perform common laboratory techniques including reflects distillation re crystallisation vacuum filtration
- How to create and carryout work up and separation procedures
- How to critically evaluate data collected to determine te identify purity and percent yield of products and to summaries findings in writing in clear and concise manner

SEMESTER IV

COURSE IV : SPECTROSCOPY & PHYSICAL CHEMISTRY (4304CHE15)

Theory:

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

1. To learn about the loss of a observation of light energy by molecules and the subsequent photo chemical reactions
2. To understand the concepts of quantum efficiency and mechanisms of photochemical reactions.
3. Get awareness about spectroscopic techniques like Electronic, Infra red and Proton magnetic resonance spectroscopy and their uses in structural elucidation of an organic compound
4. Develops in-depth knowledge about Phase equilibrium and its applications
5. Gain the knowledge about conductometric and potentiometric titrations

Laboratory:

4304CHE15: Practical-IV Physical Chemistry and IR Spectral Analysis

On successful completion of this course, the students shall be able to:

- Measure the concentration of acids through conductometric titrations
- Measure the CST (Critical Solution Temperature) of Phenol-Water system

SEMESTER V

COURSE IV : INORGANIC, ORGANIC & PHYSICAL CHEMISTRY (5314CHE15)

Theory:

- Learn about various concepts of Coordination chemistry and stereochemistry of coordination compounds
- Understands the stability of metal complexes
- The terminology in Thermodynamics and laws of Thermodynamics

Laboratory:

5314CHE15: Practical-V Organic Chemistry

- Develop skills required for the systematic qualitative analysis of organic compounds and determination of physical constants

COURSE VI : INORGANIC, ORGANIC & PHYSICAL CHEMISTRY (5324CHE15)

Theory:

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

1) Knows about kinetics of a chemical reaction and the concept of activation energy
2) Understands the various photo physical and photochemical processes
3) Learn the physical and chemical properties of Amino acids

Laboratory:

5324CHE15: Practical-VI Physical Chemistry

On successful completion of this course, the students shall be able to:

- Capable to determine the surface tension and viscosity of a liquid
- Knows the determination of rate constant for acid catalysed ester hydrolysis

SEMESTER VI

63CHE: ELECTIVE-VII-A: ANALYTICAL METHODS IN CHEMISTRY

Theory:

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

- Identify the importance of solvent extraction and ion exchange method.
- Acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis.
- Demonstrate the usage of common laboratory apparatus used in quantitative analysis.
- Understand the theories of different types of titrations.
- Gain knowledge on different types of errors and their minimization methods.
- Get awareness about separation techniques in chemical analysis and various types of chromatographic techniques, which are essential to become a good researcher
- Understand the principles of volumetric and gravimetric analysis

Laboratory:

63CHE: Practical-VII-A

On successful completion of this practical course, student shall be able to:

- Estimate Iron(II) using standard Potassium dichromate solution
- Learn the procedure for the estimation of total hardness of water
- Demonstrate the determination of chloride using Mohr's method
- Acquire skills in the operation and calibration of pH meter
- Perform the strong acid vs strong base titration using pH meter
- Expertise in Paper chromatography technique, which is a notable purification technique
- EDTA titrations

VENKATAGIRI

DEPARTMENT OF CHEMISTRY

PROGRAMME OUTCOMES & COURSE OUTCOMES

Vikrama simhapuri university :: Nellore

Common Framework of CBCS for Colleges in Andhra Pradesh

(Andhra Pradesh State Council of Higher Education)

with effect from the Academic Year 2020-21

SEMESTER I

COURSE 1: INORGANIC & PHYSICAL CHEMISTRY

Theory:

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

1. Understand the basic concepts of p-block Elements
2. Explain the difference between solids, liquids and gases in terms of intermolecular interactions.
3. Apply the concepts of gas equations.
4. Apply the concepts of pH and Electrolytes studying other chemistry courses

Laboratory:

On successful completion of this course, the students shall be able to:

- Understand the basic concepts of qualitative analysis of Inorganic mixture
- Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- Apply the concepts of common ion effect, solubility product and concepts of related to qualitative analysis

SEMESTER II

COURSE II : ORGANIC & GENERAL CHEMISTRY

Theory:

At the end of the course, the students 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 mechanism including free radical substitution electrophilic addition and electrophilic aromatic substitution.
4) Correlate and describe the stereo chemical properties of organic compound and reactions

Laboratory:

On successful completion of this course, the students shall be able to:

- Use glassware , equipment and chemicals and follow experimental procedures in the laboratory
- Understand and explain the volumetric analysis based on fundamental concepts learn in inorganic equilibrium
- Learning and identify the concepts of a standard solutions primary and secondary standards.
- Felicitate the learner to make solutions of various molar concentrations. This may include the concept of the mole converting moles to grams converting grams to moles defining concentration dilution of solutions making different molar concentrations

SEMESTER III

COURSE III : ORGANIC CHEMISTRY & SPECTROSCOPY

Theory:

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

1) Understand PREPARATION properties and reaction of alkalines, haloarenes and oxygen containing functional groups.
2) Use the synthetic chemistry learn in this course to do functional group transformations.
3) To propose plausible and mechanisms for any relevant reaction

Laboratory:

On successful completion of this course, the students shall be able to:

- How to use glassware and chemicals and follow experimental procedures in the laboratory
- How to calculate liming reagent theoretical yield and percent yield
- How to engage in safe laboratory practices by handling laboratory glassware equipment and chemical reagents appropriately
- How to depose of chemicals in a safe and responsible manner
- How to perform common laboratory techniques including reflects distillation re crystallization vacuum filtration

- How to create and carryout work up and separation procedures
- How to critically evaluate data collected to determine to identify purity and percent yield of products and to summaries findings in writing in clear and concise manner

SEMESTER IV

COURSE IV : INORGANIC , ORGANIC & PHYSICAL CHEMISTRY

Theory:

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

1. To learn about the loss of a observation of light energy by molecules and the subsequent photo chemical reactions
2. To understand the concepts of quantum efficiency and mechanisms of photochemical reactions.

Laboratory:

On successful completion of this course, the students shall be able to:

- Used glassware equipment and chemicals and follow experimental procedures in the laboratory
- Determine melting and boiling points of organic compounds
- Understand the application of concepts of different organic reactions studied in theory part of organic chemistry

COURSE V : INORGANIC & PHYSICAL CHEMISTRY

Theory:

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

4) Understand of boundary conditions and quantization probability distribution of probable values uncertainty and expectation values
5) Application of quantization to spectroscopy
6) Various types of spectra and their use in structure determination.

Laboratory:

On successful completion of this course, the students shall be able to:

- Used glassware equipment and chemicals and follow experimental procedures in the laboratory
- Apply concepts of electrochemistry in experiments
- Be familiar with electro analytical methods and technique use in Analytical chemistry which study an Analytic by measuring the potential and current in electrochemical cell containing the analyte.

SEMESTER V

COURSE 6B : ANALYTICAL METHODS IN CHEMISTRY-1

Theory:

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

1) . Identify the importance of solvent extraction and ion exchange method.

2). Acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis.

3). Demonstrate the usage of common laboratory apparatus used in quantitative analysis.

4). Understand the theories of different types of titrations.

5). Gain knowledge on different types of errors and their minimization methods.

Laboratory:

On successful completion of this practical course, student shall be able to:

- Estimate Iron(II) using standard Potassium dichromate solution
- Learn the procedure for the estimation of total hardness of water
- Demonstrate the determination of chloride using Mohr's method
- Acquire skills in the operation and calibration of pH meter
- Perform the strong acid vs strong base titration using pH meter

SEMESTER V

COURSE 7B : ANALYTICAL METHODS IN CHEMISTRY-2

Theory:

Students after successful completion of the course will be able to:

1. Identify the importance of chromatography in the separation and identification of compounds in a mixture

2. Acquire a critical knowledge on various chromatographic techniques.

3. Demonstrate skills related to analysis of water using different techniques.

4. Understand the principles of spectro chemistry in the determination of metal ions.

5. Comprehend the applications of atomic spectroscopy.

Laboratory:

On successful completion of this practical course, student shall be able to:

- Perform the separation of a given dye mixture using TLC
- Learn the preparation of TLC plates
- Demonstrate the separation of mixture of amino acids using paper chromatography
- Acquire skills in using column chromatography for the separation of dye mixture