

Subject Code: 2SC1030302

Subject Title: Chemistry - 302

Course Objective:

Generally, knowledge with the following areas in chemistry: analytical, inorganic, organic, physical and biochemistry. The faculty to job effectively and securely in a laboratory environment. Opportunities for student and faculty to interact with alumni and with professional chemists. The fundamental analytical and industrial skills to work and industrial skills to work effectively in the different fields of chemistry. The capacity to produce, divide and characterize compounds using published reactions, protocols, normal laboratory equipment, and current instrumentation.

Teaching scheme (hours) per week		Credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
3	-	3	-	70	30	-	-	100

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Chemistry of Noble gases: Introduction, Discovery of Noble gases: Occurrence, Isolation of Non-radioactive of Noble gases, Electronic configuration of Noble gases. Compound of Noble gases, Non real compounds prepared by different methods, True compounds: XeF ₂ , XeF ₄ , XeF ₆ , XeOF ₂ , XeO ₃ , XeO ₂ F ₂ , XeO ₄ , XeOF ₄ .	18	25
2	Aromatic Hydrocarbons: <i>Aromaticity:</i> Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: Effect of substituent groups, Determination of orientation, Classification of substituent groups, Orientation in disubstituted benzenes, halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directing effects of the groups.	14	25
3	Amino acids. Introduction, Classification and nomenclature, Dipolar ion structure and Isoelectric point, Synthesis of amino acids (Gabriel Phthalimide, Straker, Fisher-Malonicester), Reactions of amino acid.	10	25
4	Physical Properties & Molecular Structure: The Vacancy Theory of Liquid, Vapor-Pressure, Surface tension, Measurement of surface tension by stalagmometer, Parachor and its applications, Viscosity, Measurement of viscosity by Ostwald-viscometer, Refractive index, Specific refraction, Molar refraction, Measurement of Refractive index by Abbe's Refractometer, Optical activity, Measurement of Optical activity by Polarimeter, Dipole moment and its measurements & its application, Numericals.	18	25

Course Outcome:

- ❖ Have solid foundations in the fundamentals and purpose of current chemical and scientific theories.
- ❖ Are capable to design, carry out, record and analyze the results of chemical experiments.
- ❖ Are capable to use current instrumentation and classical techniques, to design experiments, and to properly

record the results of their experiment.

- ❖ Are skillful in problems solving, significant thinking and analytical reasoning.
- ❖ Are capable to identify and solve chemical problems and explore new areas of research.
- ❖ Are capable to use up to date library searching and retrieval methods to obtain information about a topic, chemical, chemical technique, or an issue relating to chemistry.

List of References:

Inorganic Chemistry

1. Quantum Chemistry by R.K.Prasad, Revised IIIrd Edition, Page-3,5,7,34-37,41,65-68.
2. Concise Inorganic Chemistry J.D.Lee, 4th edition, ELBS publication.

Organic Chemistry

1. Organic Chemistry by Morrison and Boyd.4th ed. Pearson Education-2003
2. Organic Chemistry by pine, Hendrickson, Cram and Hammond 4th ed. By P.S.Kalsi.
3. Advance Organic Chemistry by JerryMarch.
4. Advance Organic Chemistry by Arun Bahal andB.S.Bahal.
5. Organic Chemistry Vol. I & II by S.M.Mukherji, S.P.Sing, R.P.Kapoor.
6. Reaction mechanism and Reagents in Organic Chemistry by Gurdeep R.Chatwal 4th ed. Himalaya public House.
7. Text book of Organic Chemistry by Arun Bahal, B.S.Bhal, S.Chand.
8. Organic Spectroscopy by P.S.Kalsi.
9. Organic Chemistry by I.R.Finar.

Physical Chemistry

1. Advance Physical Chemistry by GurdeepRaj
2. Physical Chemistry (Question and Answers) by R.N.Madan, G.D.Tully,S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma,Pathania.
4. Chemical Thermodynamics by R.P.Rastogi and R.R.Mishra.
5. Essentials of Physical Chemistry by B.S.Bahal, Arun Bahal, G.D.Tully.
6. Physical Chemistry by P.W.Atkins, 5th ed., Oxford, 1994, 7th ed.,2002
7. Physical Chemistry by R.A.Alberty and R.J.Silbey, John Wiley,1995.
8. Physical Chemistry by G.H.Barrow, 5th ed. , Mac Graw Hill, 1998, 6thed.
9. Physical Chemistry by W.J.Moore, 4th ed. , Orient Longmans,1969.

Analytical Chemistry

1. Fundamentals of Analytical Chemistry by Skoos &West.
2. Analytical Chemistry, Garry D.Christain.
3. Analytical Chemistry, Day &Underwood.
4. Analytical Chemistry by Lerry& Hergins.
5. Qualitative Analysis by A.I.Vogel, 5thed.

e-Resource:

1. www.google.com
2. <http://onlinelibrary.wiley.com/>
3. https://en.wikipedia.org/wiki/Main_Page