

Subject Code: 2SC1030401	Subject Title: Chemistry - 401
---------------------------------	---------------------------------------

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	(A) Magnetic properties of Co-Ordination Compound: Type of magnetic behavior, Method of determining magnetic susceptibility, SpinFormula, Magnetic properties for 3 rd metal complexes. (B) Application of CFT: 1) For determination of color of complex, and 2) Use of C.F.S.E. value, Limitation of C.F.T., Isomerism in complexes.	18	25
2	Carbohydrates: Introduction, Definition, Classification of Monosaccharides, Nomenclature, Reactions of Glucose and Fructose. (Methylation, Acetylation, Oxidation with Br ₂ water and Conc. HNO ₃ , Reaction with HCN, NH ₂ OH, Osazone formation and Epimerization.) Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth, projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation. Disaccharides: Structure elucidation of maltose, lactose and sucrose. Polysaccharides: Elementary treatment of starch, cellulose and glycogen.	10	25
3	Heterocyclic Compound: Introduction, Nomenclature, Molecular orbital picture and aromatic characteristics of Pyrrole, Furan, Thiophene and Pyridine, Methods of synthesis and chemical reactions for Pyrrole, Furan, Thiophene and Pyridine, Electrophilic and Nucleophilic substitution reactions of pyridine, Basicity of Pyridine, Piperidine and pyrrole.	14	25

4	Ionic Equilibrium: • Introduction, Electrolysis, Ionic Equilibrium, Resistance, Conductance, Specific conductance, Equivalent Conductance, Molar Conductance, Equivalent Conductance at Infinite Dilution, Type of Conductometric Titration. • Acid-Base Titration. 1) Strong Acid Vs Strong Base. 2) Strong Acid Vs Weak Base 3) Weak Acid Vs Strong Base 4) Weak Acid Vs Weak Base 5) Strong Acid + Weak Acid Vs Strong Base. • Transport number. • Determination of Transport Number. 1) Hittorf's Method. 2) Moving Boundary Method.	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. Advance Inorganic chemistry – Satya Prakash . G.D.Tuli, S.K.Basu, R.D.Madan, S.Chand Voll-II.
2. Advance Inorganic chemistry – Satya Prakash, S.Chand Voll-I. Page No-819-828.

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 Jerry March.
4. Advance Organic Chemistry by Arun Bahal and B.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. Himalayapublic House.
7. Text book of Organic Chemistry by Arun Bahal, B.S.Bhal, S.Chand.
8. Spectroscopy of Organic Compounds 6th ed. by P.S.Kalsi.
9. Organic Chemistry by I.R.Finar.
10. Organic Spectroscopy by Williams and Kemp.
11. Spectroscopic Methods in Organic Chemistry by Dudley H.Williams and Ian Fleming.

Physical Chemistry

1. Advance Physical Chemistry by Gurdeep Raj
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.Rastogy and R.R.Misra.
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,1998,6th ed.
9. Physical Chemistry by W.J.Moore, 4th ed. , Orient Longmans, 1969.
5. Qualitative Analysis by A.I.Vogel, 5th edn.

e-Resource:

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