Integrated Bachelor and Master Programmes in Biomedical Science
IBMP (Dietetics) Semester (I)

Paper Code	IS01CDET51	Periods per week	04
Title of the paper	Chemistry	Exam Duration	3Hrs
Total Credit of the Paper	04	Total Marks	100

Course Objectives: (As per Guidelines – I)	To make students familiar with: 1. Chemistry as a subject related to Biology. 2. Historic development and scope of chemistry 3. Basic concepts related to inorganic, analytical and physical chemistry.

Course Description		
Unit	Description	Weightage*
1.	**PERIODIC PROPERTIES** **Periodic Table:** Brief introduction and types of elements, Shielding effect and effective nuclear charge, Factor affecting the magnitude of σ and Z_{eff}. **Ionization Energy**: Successive ionization energy, Factor affecting magnitude of Ionization Energy, Variation of IE values in main group element and different element groups, Ionization energies of isoelectronic species, Find out the order of second IE values of the element of second period. **Electron Affinity:** Relation between EA of X(g) atom and IE of X-(g) ion, Factor affecting the magnitude of electron affinity, Variation of electron affinity in main group and different groups elements of the periodic table. **FUNDAMENTAL CONCEPT OF COORDINATION CHEMISTRY** Definition of some terms, Classification of ligands, Chelate, chelating ligand and Chelation, Classification of chelates, Uses of Chelates, Co-ordination number and Stereochemistry of complexes, Nomenclature of co-ordination compounds	25%
2.	**IONIC EQUILIBRIA IN AQUEOUS SOLUTIONS** Acids & Bases, Arrhenius theory of Acids and Bases, The Lowry – Bronsted Concept, Strength of Acids and Bases, The Lewis concept, pH Scale, Self Ionization of water, Hydrolysis, Buffer Solutions, Indicator, Sparingly Soluble Salts, Common ion effect, Selective Precipitation, Numericals based on above topics.	25%

3.	**CHEMICAL KINETICS** Introduction, Concentration Effects, Differential Rate Laws, The Integrated Rate Laws, Experimental Determination of rate laws, Reaction Mechanisms, Elementary Processes, Mechanism and rate laws, Collision Theory of Gaseous Reactions, Temperature effects, Numerical Problems based on above topics.	25%
4.	**ANALYTICAL CHEMISTRY** Introduction, Qualitative and Quantitative analysis, Instrumental and Chemical Methods of analysis. Sampling of Solid, Liquid and Gas, Hazards in sampling, Stages of Analysis, Interferences, Selection of Methods, limitations of Analytical Methods, Classification of Errors, Accuracy and Precision, Absolute and Relative Error, Minimization of Error, rules of assigning significant figure, Rounding off, Mean, Median, Standard Deviation, Distribution of Random Error, Reliability of Results (Q-test), Comparison of Results: Student's t-test and F-test, confidence limit (interval), Numericals based on above topics.	25%

* Units will have the same weightage in the evaluation as suggested in the course outline

Teaching-Learning Methodology (As per Guidelines –II)	Conventional method (classroom blackboard teaching), ICT. Courses for B. Sc. Chemistry programme are delivered through classroom, laboratory work in a challenging, engaging, and inclusive manner that accommodates a variety of learning styles and tools (PowerPoint presentations, audio visual resources, e-resources, seminars, workshops, models).

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written Examination	15%
2.	Internal Continuous Assessment in the form of Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	University Examination	70%
4.	Minimum Passing Criteria:	

Course Outcomes: Having completed this course, student will be able to (As per Guidelines – III)

1.	To understand the various aspects of periodic tablesuch as shielding effect and effective nuclear charge and ionisation energy,
2.	Have knowledge of co-ordination chemistry that will helpful in understanding nomenclature of complexes and ligands.
3.	Learn about ionic equilibria in aqueous solutions and chemical kinetics.
4.	To understand the qualitative and quantitative analysis, theoretical analytical methods, applications of analytical chemistry and classification of errors.

Suggested References: Include reference material from where a student is expected to study the said content in APA style. Reference websites can also be included. (As per Guidelines – IV)

Sr. No.	Reference
1.	Lee J. D., *Concise Inorganic Chemistry* (4th Edition).
2.	Prakash S., Tuli, G. D., Basu, S. K., Madan R. D., *Advance inorganic chemistry* (Vol. - II).
3.	Cotton, F.A. & Wilkinson, G. *Basic Inorganic Chemistry*, Wiley.
4.	Barrow, G. M., *Physical chemistry* (6th Edition).
5.	Bahl, B.S., Tuli J. D., and Bahl, A, *Essentials of Physical Chemistry*.
6.	Sharma K. K and Sharma L. K. *A Text Book of Physical chemistry*, (5th Edition), Vikas Publishing House.
7.	Vogel, A. I., *Textbook Quantitative Chemical Analysis*, Prentice-Hall, 5th edition.
8.	Day, R. A. and Underwood A. L., *Quantitative Analysis* 6th Edition.

On-line resources available that can be used as reference material (As per Guidelines –V)

Sr. No.	On-line Resources
1.	https://ocw.mit.edu/courses/chemistry/
2.	https://swayam.gov.in/explorer?category=Chemistry

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