VANITA VISHRAM WOMEN'S UNIVERSITY

(Managed By: Vanita Vishram, Surat)

1st Women's University of Gujarat

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CHEMISTRY

B.Sc. Chemistry

SYLLABUS

As per NEP-2020

w.e.f 2024-25

INDEX

1 PREAMBLE – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a University committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

2 SALIENT FEATURES

- Based on NEP-2020 & CBCS
- Interdisciplinary as well as multidisciplinary.
- Practical-oriented, skill-based & vocation-based.
- Based on experiential learning.
- Greater exposure to internship, hands-on training, project work, field work, presentation etc.
- Mode of teaching shall be Offline.
- Qualified & Competent Faculty Members for effective teaching-learning
- Employment-Generating

3 INTRODUCTION OF THE PROGRAM

B.Sc. Chemistry Honors is a UG degree program designed to provide students with a comprehensive understanding of the fundamental principles and applications of chemistry. This undergraduate course offers a strong foundation in chemical theory, laboratory techniques and analytical skills necessary for a successful career in various scientific fields.

Students enrolled in this program will explore a wide range of topics, including organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, biochemistry and environmental chemistry. Through hands-on laboratory experiments, students will gain practical experience in conducting chemical analyses, synthesizing compounds and interpreting experimental data.

The curriculum emphasizes critical thinking, problem-solving, and scientific inquiry. Students will develop a deep understanding of chemical concepts and their practical applications in areas such as pharmaceuticals, materials science, polymer science, dyes industries, environmental science, fermentation, food & dairy and forensics etc.

Upon completion of the program, students will be well-equipped to pursue careers in research and development, quality control, chemical analysis, teaching or further studies at the postgraduate level. The course opens doors to a wide range of exciting opportunities in both industry and academia, where chemists play a crucial role in advancing scientific knowledge and addressing real-world challenges.

4 PROGRAMME OBJECTIVES (POS)

PO 1. To impart knowledge of Chemical sciences and application of chemistry in day-to-day life.

PO 2. To strengthen the in-field practical knowledge of the students by providing them hands-on experimentation, project work and field work.

PO 3. To develop capability of thinking, understanding/analyzing and interpreting and solving problems to meet the need of industries such as pharmaceuticals, materials science, polymer science, dyes industries, environmental science, food & dairy, forensics, Academia, etc. and research.

PO 4. To make learners understand about ethical aspects, safety aspects and their responsibilities towards mankind and the environment.

PO 5. To make students capable of finding entrepreneurship opportunities for betterment of society, environment.

PO 6. To make the students avail of all the basic knowledge required for various competitive examinations related to the Sciences.

5 PROGRAM SPECIFIC OUTCOMES (PSOS)

Upon completion of the B.Sc. Chemistry/B.Sc. (Hons) Chemistry program, the students would:

PSO 1. Have the knowledge of basics of Chemistry and its understanding.

PSO 2. Be able to apply their practical skills and knowledge to identify and resolve the problems related to and serve various Chemical Industries such as pharmaceuticals, materials science, polymer science, dyes industries, environmental science, food & dairy etc.

PSO 3. This program fosters interdisciplinary learning habits, enabling students to utilize modern analytical tools and software for industry and research analysis.

PSO 4. Be able to cultivate professional ethics and equip students to pursue careers in various sectors as chemists, researchers, educators, managers, regulators and professionals in chemistry-related industries.

PSO 5. Develop high-quality research encouraging scientific thinking and approach for research.

PSO 6. Develop skills for further higher studies, competitive examinations and employment.

6 PROGRAM HIGHLIGHTS:

Course Level	UG						
Program	Bachelors in Science						
Duration	3 years (6 semesters)						
Examination Type	Semester system (1-6 semesters)						
Intake	40						
Eligibility	10 + 2 in Science stream with A, B or AB group						
Mapping between POs and PSOs		PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.	PSO 6.
	PO 1.						
	PO 2.						
	PO 3.						
	PO 4.						
	PO 5.						
	PO 6.						
Job Positions	Scientist, Teacher, RnD Officials, QA/QC Executives in various sectors of Chemistry domain such as pharmaceuticals, materials science, polymer science, dyes industries, environmental science, forensics, Academia etc.						

7 Scheme of Assessment

Following is the scheme of assessment followed by the university –

Weightage (%)	Continuous Comprehensive Evaluation (CCE) (50%)	Semester End Evaluation (SEE) (50%)
100%	[Internal Exam] **(20%)** + [1. Assignments/ 2. Project work/ 3. Field work/ 4. Quiz/ 5. Group discussion/ 6. Role play/ 7. (Lab Record/ Lab Performance/ Lab work) / 8. (Seminar / Class Performance/ Poster Presentations) 9. Viva Voce/ 10. Book Review or Article Review/ 11. Case Studies/ 12. Class Test/ 13. Report Writing/ 14. Any Other as per the requirement of the subject] (Any Two) (Thread-01 + Thread-02) **(10% + 10%)** + [Attendance] **(10%)**	End Semester Examination (ESE) Theory/Practical Exams Whole Syllabus

8 Credit Structure

Proposed UG Credit structure for UG -2023								
According to Curriculum and Credit Framework for Undergraduate Programme								
Semester	**Major**	**Minor**	**Multi Disciplinary**	**Ability Enhancement Course (AEC)**	**Skill Enhancement Course (SEC)**	**Indian Knowledge System (IKS) /Value Added Courses(VAC)**	**RP/ OJT**	**Total**
1	8	4	4	2	2	2	0	22
2	8	4	4	2	2	2	0	22
3	12	0	4	2	2	2	0	22
4	12	4	0	0	2	2	0	22
5	12	8	0	2	2	0	0	22
6	12	4	0	0	4	0	0	22
Total	**64**	**24**	**12**	**10**	**14**	**8**	**0**	**132**
7	12	4	0	0	0	0	6	22
8	12	4	0	0	0	0	6	22
Total	**24**	**8**	**0**	**0**	**0**	**0**	**12**	**44**
Grand Total	**88**	**32**	**12**	**10**	**14**	**8**	**12**	**176**
* If anyone wants to exit after 2nd/ 4th Sem and wants a certificate/Diploma respectively, should complete an internship of 4 credits (60 hrs)								

VANITA VISHRAM WOMEN'S UNIVERSITY

(Managed By: Vanita Vishram, Surat)
1st Women's University of Gujarat

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CHEMISTRY

B.Sc. CHEMISTRY

SEMESTER 3

SYLLABUS

AS PER NEP-2020

W.E.F 2024-25

9 Course Structure – Paper Titles SEMESTER 3

Proposed Integrated (UG) Course structure for year – 2024-25									
Sem	**Major**	**Minor**	**Multi-Disciplinary**	**Ability Enhancement Compulsory (AEC)**	**Skill Enhancement Course (SEC)**	**Indian Knowledge System / Value Added Courses (IKS/VAC)**	**Summer Internship/ Project/ Online Course**	**Dissertation**	**Total**
3	Major-I Inorganic Chemistry-III (Th3+Pr1)	-	Offered by other Departments	Communication Skills-I	Life Skills	**Indian Knowledge System-Vigyan**	-	-	07
	Major-II Organic Chemistry-III (3Th +1Pr)	-							
	Major-III Physical Chemistry-III (Th 3 +Pr 1)	-							

10 Teaching and Evaluation Scheme for BSc Chemistry academic year 2024-25

Semester	Course Code	Course Category	Course Title	Teaching Scheme				Examination Scheme													Total Credit
								Theory						Practical							
				Contact Hours			Total Credit	Credit	CCE		SEE			Credit	CCE		SEE			Total	
				Theory	Practical	Total			Max.	Passing	Max.	Passing	CCE+SEE Passing		Max.	Passing	Max.	Passing	CCE+SEE Passing		
III (NEP)	CHM205-2C	Major	Inorganic Chemistry-III (Theory)	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	4
			Inorganic Chemistry-III (Practical)	0	2	2	1	0	0	0	0	0	0	1	15	5	15	5	10	30	
	CHM206-2C	Major	Organic Chemistry-III (Theory)	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	4
			Organic Chemistry-III (Practical)	0	2	2	1	0	0	0	0	0	0	1	15	5	15	5	10	30	
	CHM207-2C	Major	Physical Chemistry-III (Theory)	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	4
			Physical Chemistry-III (Practical)	0	2	2	1	0	0	0	0	0	0	1	15	5	15	5	10	30	
	MDC203-2C	Multi Disciplinary	Personal Finance (Theory) Holistic Wellness (Theory) Material Recycling and Waste Management (Theory)	4	0	4	4	4	50	18	50	18	36	0	0	0	0	0	0	100	4

	AEC203-2C	AEC	Comunication Skills-I (Theory)	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
	SEC203-2C	SEC	Life Skills (Theory)	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
	IKS202-2C	VAC/IKS	Indian Knowledge System: Vigyan (Theory)	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
TOTAL MARKS																				**550**	**22**

11 SYLLABUS: SEMESTER 3

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Chemistry
B.Sc. Chemistry Program
SY B.Sc.
Semester III

CHM205-1C: INORGANIC CHEMISTRY-III

Credit Th 3 + 1Pr **Contact Hour per week:Th3+ 2Pr**

Outline of the Course:

Course type	Theory
Purpose of Course	The course aims to provide a foundation for understanding the inorganic chemistry concept of metal-ligand bonding, geometry and properties. It gives students the fundamental information and abilities needed for inorganic chemistry research and applications.
Course Objective	CO 1. Gain a comprehensive understanding of the fundamental concepts of coordination chemistry, including coordination number, ligands, metal-ligand bonding, and coordination geometries. CO 2. Learn about the similarities and differences in chemical properties within each group of the periodic table, including alkali metals, alkaline earth metals. CO 3. Gain an understanding of the nature and properties of metal-carbon bonds, including bonding theories such as σ-bonding, π-bonding, and backbonding. CO 4. Gain a comprehensive understanding of the theoretical principles and concepts underlying inorganic qualitative analysis. This involves learning about various chemical reactions, precipitation, complex formation, and other analytical techniques specific to inorganic compounds.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Prerequisite	Elementary knowledge of Inorganic Chemistry
Teaching Methodology	Class Room Teaching, Use of ICT, Class exercise, Discussion and Assignment
Evaluation Method	50% Continuous Assessment (CA) 50% End Semester Examination (ESE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Coordination Chemistry -I :** Introduction, Definition, Nomenclature, coordination number 2,3,4,5, 6, 7, 8, 9, 10, isomerism, valence bond theory, crystal field theory, application of CFT, Jahn-Teller effect, nephelauxetic effect.	25 %	15
2	**Chemistry of Main Group elements - I:** Classification of Elements and Periodic Properties, Periodic Properties,Periodic Trends and Classification of main group Compounds, Classification of Main Group Compounds, Effective Nuclear Charge, Structure and Bonding aspects: Lewis Structures and VSEPR Theory, Chemistry of alkali and alkaline earth metals	25 %	15
3	**Metal Carbonyls:** Mononuclear, Polynuclear, Non-bridged carbonyls, Bridged carbonyls, General methods of preparation of carbonyls, Physical and Chemical properties of metal carbonyls, $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Mn_2(CO)_{10}$, $Cr(CO)_6$, $Co_2(CO)_8$. Structure of CO molecule on the basis of VBT, MOT of CO molecule, EAN rule, Use of IR absorption spectra of metallic carbonyls	25 %	15
Pr	**INORGANIC QUALITATIVE ANALYSIS (Inorganic qualitative analysis of 2 cations and 2 anions)** **N. B. Candidates should perform the analysis of at least 6 inorganic mixture compounds.**	25%	30

REFERENCE:

1. Inorganic Chemistry second edition by Catherine E. Housecroft and Alan G. Sharpe, Pearson, 2005.
2. Peter Atkins, Peter William Atkins, Duward F. Shriver, Inorganic Chemistry, Oxford University Press, 5th edition, 2010.
3. Norman Greenwood and A. Earnshaw, Chemistry of the Elements, Elsevier, 2nd edition, 1997.
4. F. A. Cotton, G. Wilkinson, C. A. Murillo and M. Bochmann, Advanced Inorganic Chemistry, Wiley Eastern, John Wiley, 6th edition, 1999.
5. Robert H. Crabtree, Organometallic Chemistry, 4th edition, Wiley VCH, 2005.
6. C. Elsehenbroich and A. Salzer, Organometallic Chemistry, 2nd edition, Wiley VCH, 1992.
7. Quantitative analysis by R.A. Day and A.L. Underwood.
8. Vogel's qualitative inorganic analysis.

COURSE OUTCOMES:

After completing the course, the students will be able to:

CO 1.	Students should understand the fundamental concepts of coordination chemistry, including coordination number, ligands, metal-ligand bonding, isomerism, and coordination geometries.
CO 2.	Students should comprehend the principles of chemical bonding in main group elements, including ionic bonding, covalent bonding, and metallic bonding. They should also be able to predict the types of bonds formed by elements based on their position in the periodic table.
CO 3.	Students should understand the fundamental concepts of organometallic chemistry, including the nature of metal-carbon bonds, ligand types, coordination modes, and reaction mechanisms.
CO 4.	Develop proficiency in identifying various ions present in a given sample through qualitative analysis techniques. This includes recognizing characteristic reactions and properties of different ions and groups of ions.
CO 5.	Acquire practical laboratory skills necessary for performing qualitative analysis experiments safely and effectively. This involves learning proper laboratory techniques, including handling chemicals, using equipment, and interpreting experimental results.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes				
		CO 1	CO 2	CO 3	CO4	CO5
1	Coordination Chemistry -I					
2	Chemistry of Main Group elements - I					
3	Organometallic Chemistry -I					
	Inorganic Chemistry Practical					

COURSE ARTICULATION MATRIX

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					
CO4					
CO5					

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Chemistry
B.Sc. Chemistry Program
FY B.Sc.
Semester II

CHM206-1C: ORGANIC CHEMISTRY-III

Credit Th3+Pr1 **Contact Hour per week:Th3+Pr2**

Outline of the Course:

Course type	Theory
Purpose of Course	The course aims to provide a foundation for understanding the basics of organic reaction, the concept of oxidizing and reducing reagents used in the synthesis of organic compounds. It equips students with essential knowledge and skills necessary for further studies and applications in organic chemistry.
Course Objective	CO 1. Learning the concepts, mechanism and importance of organic reactions. CO 2. Students can learn the concepts of reagents in organic synthesis. CO 3. To study the oxidizing and reducing reagents in organic chemistry. CO 4. Students can understand the application of reactive intermediates in organic reactions.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Elementary knowledge of Chemistry
Teaching Methodology	Class Room Teaching, Use of ICT, Class exercise, Discussion and Assignment
Evaluation Method	50% Continuous Assessment (CA) 50% End Semester Examination (ESE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Organic Reactions-I** General nature, Reaction mechanism and applications of the following reactions: Aldol Reaction, Claisen Condensation, Arndt-Eistert Reaction, Reimer-Tiemann Reaction, Kolbe-Schmitt Reaction, Mannich reaction, Michael Reaction, Hoffmann Bromamide Reaction.	25 %	15
2	**Oxidizing Reagents** Metal based oxidizing reagents: A review and detailed discussion of chromium, manganese and silver. Non-metal based oxidizing reagents: DMSO, peroxide, peracid. Miscellaneous oxidizing reagents: DMP and DDQ.	25 %	15
3	**Reducing Reagents** Hydride transfer reagents: $NaBH_4$, Luche reduction, $LiAlH_4$, DIBAL-H, Red-Al, Metal based reductions using Li/Na in liquid ammonia, sodium, magnesium, zinc.	25 %	15
Pr	**ORGANIC QUALITATIVE ANALYSIS** **(Organic Qualitative Analysis of Binary Mixture)** Organic Qualitative Analysis of given binary mixture (Solid+Solid): Detection of type (Acid/Phenol/Base/Neutral), Separation of mixture, Identification with M.P./B.P. **N. B. Candidates should perform the analysis of at least 6 compounds.**	25 %	30

REFERENCE:

1. F. A. Carey, R. J. Sundberg, Advanced Organic Chemistry, Part A: Structure and mechanism, Kluwer Academic Publisher, (2000).
2. Organic Chemistry by Bahl & Bahl.
3. McMurry, J.E. Fundamentals of Organic Chemistry, Seventh edition Cengage Learning, 2013.
4. Solomons, T.W G., Fryhle, B. Craig. Organic Chemistry, John Wiley & Sons, Inc (2009).
5. Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press Inc., New York (2001).
6. P Sykes, A GuideBook to Mechanism in Organic Chemistry, 6th Edition (1997), Orient Longman, New Delhi.
7. Text book of Organic Chemistry by P. S. Kalsi, 1999, MacMillan of India Pvt. Ltd.
8. Morrison, R. N. & Boyd, R. N. Organic Chemistry, 6th Edn., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
9. Quantitative analysis by R.A. Day and A.L. Underwood.
10. Vogel's qualitative organic analysis.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Students will be able to study basic concepts and basic principles about organic compounds, organic reactions with mechanisms.
CO 2.	Students will be able to understand the importance of oxidizing and reducing reagents in organic chemistry.
CO 3.	Students will be able to learn the concepts of specific reagents used in the synthesis of organic compounds.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes		
		CO 1	CO 2	CO 3
1	Organic Reactions-I			
2	Oxidizing Reagents			
3	Reducing Reagents			

COURSE ARTICULATION MATRIX

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1						
CO2						
CO3						

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Chemistry
B.Sc. Chemistry Program
S.Y. B.Sc.
Semester III

CHE207-1C: PHYSICAL CHEMISTRY-III

Credit Th3+Pr1 **Contact Hour per week:Th3+Pr2**

Outline of the Course:

Course type	Theory
Purpose of Course	The course aims to provide a foundation for understanding the fundamental principles, properties, and reactions of electrolysis, spectroscopy and photochemistry. It equips students with essential knowledge and skills necessary for further studies and applications in chemistry.
Course Objective	CO 1. Able to apply the Kohlrausch's law for the real salt system. CO 2. Able to explain photochemical interaction in various system. CO 3. Able to explain phenomenon take place in the molecules when interact with radiation.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Elementary knowledge of Chemistry
Teaching Methodology	Class Room Teaching, Use of ICT, Class exercise, Discussion and Assignment
Evaluation Method	50% Continuous Assessment (CA) 50% End Semester Examination (ESE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Theory of Electrolytic Dissociation:** Arrhenius theory of Ionisation, Migration of ions, Relative speed of ions, Hittorf's method, Moving boundary Method, Kohlrausch's law, Applications of Kohlrausch's law, Calculations of (1) $\lambda\infty$ for Weak electrolytes, (2) Absolute Ionic mobilities, (3) solubility of sparingly soluble salts, (4) Degree of Dissociation or Conductance Ratio, (5) Calculation of the Ionic product for Water	25 %	15
2	**Molecular Spectroscopy:** Introduction to molecular spectra, Relationship of Electromagnetic radiation with wavelength and energy, Molecular energy levels:(a) Rotational energy; (b) Vibrational energy; and (c) Electronic energy, Absorption spectrophotometer, Types of molecular spectra, Electronic Spectra, Vibrational Spectra, Rotational Spectra, Vibrational-Rotational spectra, Numericals.	25 %	15
3	**Photochemistry** Photochemical reactions, Difference between Photochemical and Thermochemical reactions, Thermopile, Photoelectric cell, Chemical actinometer, Laws of photochemistry, Grothus-draper law, Stark-einstein law of Photochemical equivalence, Quantum yield (or quantum Efficiency), Calculation of quantum Yield, Photosensitized reactions Photophysical processes, Fluorescence, Phosphorescence, Chemiluminescence, Numericals	25 %	15
Pr	**Any Four** 1. Conductometric Titration: To determine the normality of the given HCl solution by the conductometric titration with the given 0·1 N NaOH solution 2. Chemical Kinetics - Ester hydrolysis: To study the monomolecular reaction in the hydrolysis of methyl acetate in 0.5 N HCl at different initial concentrations. 3. Saponification: To investigate the reaction in saponification of Ethyl acetate by NaOH. 4. Viscosity: To determine the viscosity of the given liquids and the % of unknown mixture 'C'. 5. Colourimetry: To verify Lambert-Beer's law for $KMnO_4$ solution.	25%	30

REFERENCE:

1. Atkins P. and De Paula, J. Physical Chemistry Tenth Ed., OUP, 2014.
2. Engel, T. and Reid, P. Physical Chemistry 3rd Ed., Prentice Hall, 2012.
3. Essentials of physical chemistry by A. S. Bhal and G. D. Tuli, Pub : S. Chand

4. Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-Hill: New Delhi (2006).
5. Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill, 2011.
6. Advanced Physical Chemistry practicals by J.B. Yadav, Goel Publishing.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Able to apply the Kohlrausch's law for the real salt system.
CO 2.	Able to explain photochemical interaction in various system.
CO 3.	Able to explain phenomenon take place in the molecules when interact with radiation.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes		
		CO 1	CO 2	CO 3
1	**Theory of Electrolytic Dissociation**			
2	**Molecular Spectroscopy**			
3	**Photochemistry**			

COURSE ARTICULATION MATRIX

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1						
CO2						
CO3						

12 Teaching Methodology

A teaching method comprises the principles and methods used by teachers to enable student learning. In order to achieve its objective of focused process- based learning and holistic development, the teacher/faculty may use a variety of knowledge delivery methods:

12.1 Lectures/Class works:

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get ne w insights in the subject area, on which they can build their own bridges to higher learning. Classwork has the ability to enhance relationships between teachers and students. Create goal- oriented tasks for students to prepare and enable self-learning.

12.2 Discussions/ Seminars/Presentation:

Discussions / seminars / presentation are critical components of learning and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real-life issues and discussion groups lead to innovative problem-solving and ultimately to success.

12.3 Case Studies/ Self-Study:

Real case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of the knowledge domain concerned. Technology is transforming higher Education learning and teaching through various case studies to improve overall standards.

12.4 Practical/Problem sheet:

Practical ability is the essential requirement for computer science undergraduates' ability structure, and it emphasizes that computer science undergraduates should have a good grasp of theory from practice and then apply the theory to practice, improving them own software developing skills and employability.

12.5 Assignments:

Computer science assignments not only help students overcome their fear and stress but also help them learn more interesting facts about the subjects of computer science which are part of their syllabus and also out of curriculum.

12.6 Industrial Tours:

Computer Science students have to know the things practically through interaction, working methods and employment practices. Moreover, it gives exposure from an academic point of view. Main aim of the industrial visit is to provide an exposure to students about the practical working environment.

12.7 Team Work:

Teamwork based projects challenge the student to apply the technical knowledge they gain in college to solve meaningful and complex problems. Positive collaboration in the form of team work is critical in the classroom environment, for which it is necessary to transcend one’s prejudices and predilections so as to achieve the desired outcomes. In the process of

team work, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

13 KEYWORDS

- Bachelor of Science (B.Sc.) in Chemistry
- VSEPR Theory
- Metal Carbonyl
- Organic Reaction
- Reducing reagents
- Qualitative analysis
- Quantitative analysis
- Coordination chemistry
- John-Teller effect
- Electrochemistry
- Photochemistry
- Molecular spectroscopy