Ref. No: LIET/CHEMISTRY /BOS-5/MOM/2026/1 Date: 29th April, 2026

DEPARTMENT OF CHEMISTRY

MINUTES OF THE FIFTH BOARD OF STUDIES MEETING

The Fifth Board of Studies Meeting of the Department of Chemistry was conducted through circulation with the following members on 29th April, 2026 to review and approve the given agenda.

Members Present:

Courses: Engineering Chemistry (Theory & Lab), Environmental Sciences				
S. No.	**Name**	**Designation**	**Category**	**Signature**
1.	Dr. Rehana Anjum	Professor & HOD, Dept. of Chemistry, LIET	Chairperson	
Nominees of Osmania University, Hyderabad				
2.	Prof. M. Vijjulatha	Professor and Head, Department of Chemistry, University College of Science, Osmania University, Hyderabad.	University Nominee	
Experts / Academicians from Outside the Parent University nominated by the Academic Council				
3.	Prof. Salman Ahmad Khan	Professor and Head, Department of Chemistry, School of Sciences, Maulana Azad National Urdu University, Hyderabad, Telangana, India.	External Member	
4.	Dr. R. Gangadhar	Associate Professor, Chemistry Stanley College of Engineering and Technology for Women, Hyderabad.	External Member	R.G 29/4/26 (Dr R Gangadhara)
Representatives from R&D / Industry / Corporate Sector / Allied areas relating to placements				
5.	Mr. Hasan Zubair	Delivery Partner, Financial Services, IBM, Hyderabad	Corporate Sector	
6.	Mr Syed Shujauddin	Business Development Manager, Tata Capital, Hyderabad.	Alumni	
Faculty members from each specialization				
7.	Dr. Md. Sameer Ahmed	Associate Professor, Chemistry, LIET	Internal Member	
8	Mrs. Anjum Begum	Sr. Assistant Professor, Chemistry, LIET	Internal Member	

9.	Dr. Sameera Begum	Assistant Professor in Chemistry, LIET	Internal Member	Sameera Begum
10.	Dr. Afreen	Assistant Professor in Chemistry, LIET	Internal Member	
11.	Dr. Akanksha Gupta	Assistant Professor in Chemistry, LIET	Internal Member	
12.	Mrs. Arshiya Anjum	Assistant Professor in Chemistry, LIET	Internal Member	
13.	D. Sirisha	Assistant Professor in Chemistry, LIET	Internal Member	
14.	G. Radhika	Assistant Professor in Chemistry, LIET	Internal Member	
15.	PM. Sudharani	Assistant Professor in Chemistry, LIET	Internal Member	

The Meeting was conducted as per the schedule to approve the agenda given below:

AGENDA:

1. Introduction of BOS Members to the faculty and vice versa
2. Confirmation of last BOS minutes of meeting held on 21-06-2025 at 11:00 am
3. Action taken report on the last BOS minutes held on 21-06-2025.
4. Extension of approval of Courses and Syllabi of LR – 26 for the Academic Year, 2026-27.
    a. Engineering Chemistry (Theory).
    b. Engineering Chemistry Lab
    c. Environmental Sciences (Theory)
5. Approval and Ratification of Question Paper Setters, Examiners & Evaluators of B.E.
6. Suggestions on Innovative Teaching and Learning Process, Evaluation, Research and Development, and Extension Activities.
7. Any other point with the permission of the chair.

Item No. 1: Introduction of BOS Members to the faculty and vice versa.

Deliberation: BOS Chairperson Chemistry welcomed the members of the Board of Studies, Principal, Dean - I Year, and other faculty members of the meeting, for the extension and approval of the above-sanctioned courses and syllabi for academic year 2026-27.

- BOS Chairperson introduced the BOS members to the Principal and Dean-I Year, LIET, and the faculty members of the department introduced themselves to the honorable University Nominee, Subject experts, Industry expert, and the Alumnus.

- BOS Chairperson further presented the brief profile of the department.

Resolution: Noted and Approved.

Item No. 2: Confirmation of last BOS minutes of meeting held on 21-06-2025 at 11:00 a.m.

Deliberation: BOS Chairperson presented all the Minutes of the last meeting, and they were verified and confirmed.

Resolution: Noted and Approved.

Item No. 3: Action taken report for the previous BOS minutes of the meeting held on 21-06-2025.
Deliberation: BOS Chairperson presented the Action Plan taken up on the Minutes of the last BOS meeting held on 21-06-2025 as mentioned in the tabular column below:

S.No	Points Discussed	Action Plan Taken
1.	University Nominee suggested the following points: • To include more content as per the requirements of Engineering students. • Teaching hours for all units should be the same.	All the Suggestions given by the university Nominee have been taken up and included in the syllabus of LR-24.
2.	Subject Expert-1 suggested the following points: • The topic should be specific so that it can have a clear picture for students. • Include more content in the battery. • Recommended a textbook for Green Chemistry. • Emphasized on Latest Edition books on Environmental Sciences.	All the Suggestions given by Subject Expert-1 have been taken up, and small changes were made accordingly in the syllabus at the required places. A Book is recommended to the Central Library for Green Chemistry and Environmental Sciences.
3.	Subject Expert-2 suggested the following points: • Inclusion of the topic introduction to battery and electroplating which provides a better understanding of Electroless Ni Plating. •	The suggestions of the Subject Expert-2 have been taken up, and modifications were made accordingly in the syllabus.
4.	Industry Representative suggested the following: The syllabus should be appropriate for industrial requirements.	Industry expert's suggestions included in the Syllabus of LR-24.
5	Alumnus suggested the following: • Suggested to keep the syllabus as precise and effective from an engineering perspective.	The syllabus was reviewed, and it's precise for an Engineering student.

Resolution: Noted and Approved

Item No. 4: Extension and approval of the course syllabi of LR-26 B. E - I for the adaptation for the academic year 2026-2027.

a. Engineering Chemistry (Theory).
b. Engineering Chemistry Lab
c. Environmental Sciences (Theory)

Deliberation: The Chairperson-BOS presented detailed syllabi of "Engineering Chemistry (T & L) and Environmental Sciences (Theory)" B.E.-I year of LR-26 Regulation to be adopted from the academic year 2026 - 27.

Following points discussed :

- The advanced topics looking at the industry needs can be added.
- Inclusion of the topics related to Spectroscopy
- Recommended to include textbooks for Spectroscopy.:
- Suggested to keep the syllabus as precise and effective from an engineering perspective.
- It was discussed and resolved that, instead of mentioning a common Sustainable Development Goal (SDG), the **ES syllabus** shall include the **specific SDG goal(s)** that are directly relevant to the course outcomes and course content, ensuring meaningful alignment with the teaching-learning process.

Resolution: The Courses and syllabi of LR-26 are **noted and approved for the A.Y. 2026-27.**

The detailed approved syllabi are given in Annexure I to IV.

Item No. 5: Approval & Ratification of Question Paper Setters, Examiners & Evaluators of B.E. I, II, III & IV Semester of LR-26 **[A.Y. 2026-27]**

Deliberation: The Chairperson of BOS presented the List of Question Paper Setters, Examiners & Evaluators of B.E I, II, III & IV Semesters [Chemistry department related courses] of LR-26, and after an elaborate discussion, BOS Members suggested the following points:

- Members advised that the paper setter and evaluators should have a minimum of 10 years of teaching experience in the concerned subject.
- Members recommended that no repetition of paper setters should take place for at least two years.

Resolution: All Members have approved and ratified the same.

Item No.6: Suggestions on Innovative teaching & learning process, evaluation, research, and development.

Deliberation: BOS members suggested an Innovative teaching and learning process, Evaluation, Research, and Development of the Chemistry Department, and suggested to attend and conduct FDPs, Awareness programs to publish research articles in Web of Science and Scopus-indexed journals, etc.

Resolution: Noted and Approved

Dean-I Year acknowledged the suggestions provided by the BOS members, expressed gratitude for

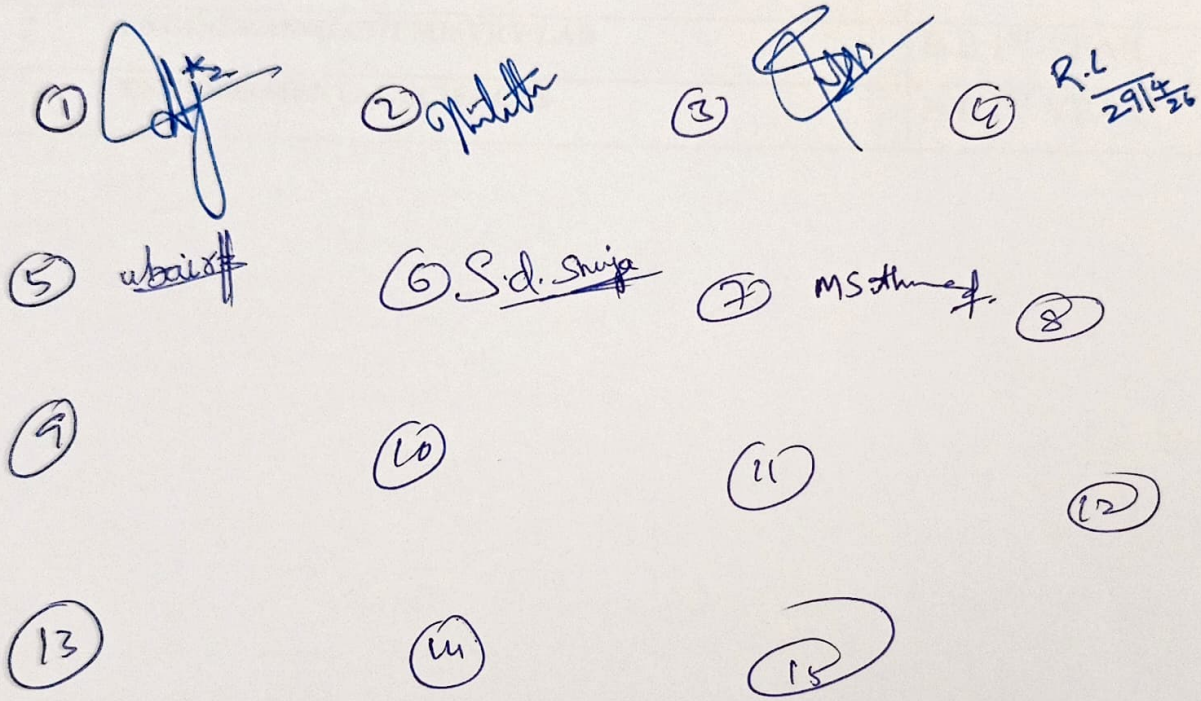
their acceptance of the invitation and participation in the meeting and officially concluded the session.

BOS Chairperson thanked all the members for the suggestions towards improvement.

BOS Chairperson expressed gratitude to the BOS members for their time in approving the Courses & Syllabi and also thanked the Principal, Dean-I Year, HODs, faculty members, and management for their support, guidance, and encouragement.

The meeting was concluded with the approval of the University Nominee and the consensus of all BOS Members.

Prof. Dr. Rehana Anjum
Chairperson – Board of Studies
Department of Chemistry
Lords Institute of Engineering and Technology [A]



ANNEXURE - I

APPROVED COURSE TITLES

S.No	Approved Course Title	Programme
1	**ENGINEERING CHEMISTRY (THEORY)**	B.E 1ST YEAR
2	**ENGINEERING CHEMISTRY LAB**	B.E 1ST YEAR
3	**ENVIRONMENTAL SCIENCES**	B.E 1ST YEAR

ANNEXURE - II
APPROVED ENGINEERING CHEMISTRY SYLLABUS

Course code	Course Title						Core/Elective
U26CH101	ENGINEERING CHEMISTRY						Core
Pre-requisites	Contact Hours Per Week				CIE	SEE	Credits
-	L	T	D	P			
	3	–	-	-	40	60	3

Course Objectives:

1. To understand and apply fundamentals of battery chemistry in Engineering applications.
2. To get acquainted with hard water and corrosion and apply the techniques for softening and corrosion control method.
3. Correlate the properties of materials with their internal structure and their use for Engineering application
4. Exposure to qualitative and quantitative parameters of chemical fuels.
5. To develop the concept of green chemistry in modern trends in engineering.

Course Outcomes:

1. Discuss the fundamental principles of electrochemical cells.
2. Determine the total hardness of water and apply the corrosion control methods.
3. Illustrate the synthesis and applications of engineering materials.
4. Identify various fuels and compare their key properties and applications.
5. Apply the principles of green chemistry for sustainable environment.

Desirable / Advanced Course Outcomes

1. Develop electroplating and corrosion prevention methods and critically evaluate the electrochemical performance of batteries.
2. Formulate strategies to optimize fuel usage

UNIT-I ELECTROCHEMISTRY AND BATTERIES:

Electrochemistry: Types of cells, cell notation, cell reaction and cell potential. Nernst equation and its derivation. Applications of Nernst equation to electrode potential and EMF of a cell. Numerical problems. Types of electrodes: Calomel and Quinhydrone. Determination of pH by using Quinhydrone electrode.

Batteries: Introduction to Batteries, **Secondary battery:** Lead acid battery and Li-Ion battery. **Flow batteries:** Methanol-Oxygen fuel cell.

UNIT- II WATER CHEMISTRY AND CORROSION:

Water Chemistry: Hardness of water, its types and units of hardness, Estimation of hardness by EDTA method. Softening of water by Ion exchange process, reverse osmosis method. Potable water and its specifications, disinfection of water by chlorination and break point Chlorination. **Corrosion:** Introduction, causes and effects. Theories of corrosions- Wet corrosion and its mechanism. Factors affecting rate of corrosion. **Corrosion Control Methods:** Cathodic Protection, Sacrificial anodic method, impressed current method Surface coating method- Electroplating, Electroless Ni plating.

UNIT- III POLYMERS

Polymers: Basics terms in polymers: Monomer and its functionality, Polymers and Degree of polymerization. Types of polymerizations, Classification of Polymers – Thermoplastics and Thermosetting resins. **Preparation, Properties and engineering applications of: Plastics-** PVC and Bakelite. **Fibres:** Nylon 6:6, Kevlar. **Elastomers:** Buna-S.

Conducting polymers: Definition, Mechanism of conduction in Poly-acetylene, Applications of conducting polymers.

Biodegradable polymers: Introduction, preparation, properties and applications of Polylactic acid.

UNIT- IV CHEMICAL FUELS: Definition and classification of fuels- Primary and secondary fuels. Solid, liquid and gaseous fuels. Requirements of a good fuel. Calorific Value – HCV and LCV. Theoretical calculations of calorific value by Dulong 's formula – Numerical problems.

Solid Fuels: Analysis of coal - Proximate and Ultimate analysis.

Liquid Fuels: Refining of Petroleum. Composition and uses of Gasoline, Diesel and Kerosene.

Gaseous Fuels: LPG, CNG -Composition and Uses. **Combustion:** calculation of air quantities by weight required for combustion of a fuel- Numerical problems.

Biodiesel: Sources, Concept of Trans esterification and carbon neutrality, Properties and significance.

UNIT –V GREEN CHEMISTRY & SPECTROSCOPY

Green Chemistry: Concept, Principles of Green Chemistry.

Spectroscopy: Description of Electromagnetic spectrum.

Principles of UV-Visible Spectroscopy: Statement of Beer-Lambert's law.

Absorption and intensity shifts: Bathochromic, Hypsochromic, Hyperchromic and Hypochromic shifts with one example each.

Principle and applications of UV-Visible Spectroscopy

IR Spectroscopy: Principles and applications of IR Spectroscopy.

NMR Spectroscopy: Principles of H ^{1}-NMR Spectroscopy, multiplicity, Chemical Shift. Principle and applications of MRI.

Text Books:

1. Instrumental Methods of Chemical Analysis, Gurdeep R. Chatwal & Sham Anand, *Instrumental Methods of Chemical Analysis*, Himalaya Publishing House, 5th Edn, Mumbai (2025)
2. P.CJain & M. Jain, Engineering Chemistry, Dhan Patrai and sons Publishing Company,17th Edn, New Delhi (2019)
3. Spectroscopy of Organic Compounds, P. S. Kalsi, *Spectroscopy of Organic Compounds*, New Age International Publishers, Latest Multicolour Edition, New Delhi (2022).
4. Rama D, V.Ramana Reddy and P.Rath, Engg. Chemistry, CengageLearning, New Delhi,2019
5. Puri and Sharma, Principles of Physical Chemistry, Vishal Publications Co.2019

Reference Books:

1.C. V. Agarwal, C. P. Murthy, A. Naidu, "Chemistry of Engineering Materials", Wiley India, 5thEdition, 2013.

2.R. P. Mani, K. N. Mishra, "Chemistry of Engineering Materials", Cengage Learning, 3rd Edition, 2015.

APPROVED ENGINEERING CHEMISTRY LAB SYLLABUS

Course code	Course Title						Core/Elective
U26CH1L1	ENGINEERING CHEMISTRY LAB						Core
Pre-requisites	Contact Hours Per Week				CIE	SEE	Credits
-	L	T	D	P			
	-	-	-	3	25	50	1.5

Course Objectives:

1. Conduct experiments, take measurements and analyze the data through hands-onexperience in order to demonstrate understanding of the theoretical concepts of quantitative analysis while working in small group.
2. Interpret the electro analytical principles with experimental results graphically.
3. Demonstrate writing skills through clear laboratory reports.

Course Outcomes:

1. Demonstrate the amount of Ferrous ions by volumetric analysis.
2. Calculate the total hardness and alkalinity of water.
3. Explain the mobility of ions in strong acids and weak acids using conductivity meter.
4. Compute the amount of Fe^{+2} and HCl by using potentiometer.
5. Infer Beer- Lambert's law by Colorimetry and demonstrate the synthesis of Aspirin and paracetamol.

Desirable / Advanced Course Outcomes

1. Analyze data critically and draw meaningful conclusions from experimental results.
2. Relate laboratory findings to industrial, environmental, and medical fields.

LIST OF EXPERIMENTS

Introduction to Chemical Analysis.

Techniques of Weighing.

VOLUMETRIC ANALYSIS:

1. Determination of strength of Ferrous solution by Dichrometry.
2. Determination of strength of Ferrous solution by Permanganometry.
3. Determination of hardness of water by Complexometric method using EDTA.
4. Determination of strength of Carbonates and bicarbonates in a given mixture.

INSTRUMENTAL ANALYSIS:

Conductometer:

5. Determination of strength of given HCl solution
6. Determination of strength of CH_3COOH solution
7. Determination of strength of HCl & CH_3COOH in given mixture

Potentiometer:

8. Determination of strength of HCl solution
9. Determination of strength of Ferrous solution.

pH Meter:

10. Determination of strength of HCl solution

Colorimeter:

11. Verification of Beer-Lambert 's law and determination of Permanganate.

CHEMICAL KINETICS:

12. Determination of rate constant of acid catalyzed hydrolysis of methyl acetate.

DRUG SYNTHESIS:

13. Synthesis of Drug Aspirin & Paracetamol.

ANNEXURE-III

APPROVED ENGINEERING CHEMISTRY SYLLABUS

Course code	Course Title						Core/Elective
U26CH201	ENGINEERING CHEMISTRY						Core
Pre-requisites	Contact Hours Per Week				CIE	SEE	Credits
	L	T	D	P			
-	3	–	-	-	40	60	3

Course Objectives:

1. To understand and apply fundamentals of battery chemistry in Engineering applications.
2. To get acquainted with hard water and corrosion and apply the techniques for softening and corrosion control method.
3. Correlate the properties of materials with their internal structure and their use for Engineering application
4. Exposure to qualitative and quantitative parameters of chemical fuels.
5. To develop the concept of green chemistry in modern trends in engineering.

Course Outcomes:

1. Discuss the fundamental principles of electrochemical cells.
2. Determine the total hardness of water and apply the corrosion control methods.
3. Illustrate the synthesis and applications of engineering materials.
4. Identify various fuels and compare their key properties and applications.
5. Apply the principles of green chemistry for sustainable environment.

Desirable / Advanced Course Outcomes

1. Develop electroplating and corrosion prevention methods and critically evaluate the electrochemical performance of batteries.
2. Formulate strategies to optimize fuel usage

UNIT-I ELECTROCHEMISTRY AND BATTERIES:

Electrochemistry: Types of cells, cell notation, cell reaction and cell potential. Nernst equation and its derivation. Applications of Nernst equation to electrode potential and EMF of a cell. Numerical problems. Types of electrodes: Calomel and Quinhydrone. Determination of pH by using Quinhydrone electrode.

Batteries: Introduction to Batteries, **Secondary battery:** Lead acid battery and Li-Ion battery. **Flow batteries:** Methanol-Oxygen fuel cell.

UNIT- II WATER CHEMISTRY AND CORROSION:

Water Chemistry: Hardness of water, its types and units of hardness, Estimation of hardness by EDTA method. Softening of water by Ion exchange process, reverse osmosis method. Potable water and its specifications, disinfection of water by chlorination and break point Chlorination. **Corrosion:** Introduction, causes and effects. Theories of corrosions- Wet corrosion and its mechanism. Factors affecting rate of corrosion. **Corrosion Control Methods:** Cathodic Protection, Sacrificial anodic method, impressed current method Surface coating method- Electroplating, Electroless Ni plating.

UNIT- III POLYMERS

Polymers: Basics terms in polymers: Monomer and its functionality, Polymers and Degree of polymerization. Types of polymerizations, Classification of Polymers – Thermoplastics and Thermosetting resins. **Preparation, Properties and engineering applications of: Plastics-** PVC and Bakelite. **Fibres:** Nylon 6:6, Kevlar. **Elastomers:** Buna-S.

Conducting polymers: Definition, Mechanism of conduction in Poly-acetylene, Applications of conducting polymers.

Biodegradable polymers: Introduction, preparation, properties and applications of Polylactic acid.

UNIT- IV CHEMICAL FUELS: Definition and classification of fuels- Primary and secondary fuels. Solid, liquid and gaseous fuels. Requirements of a good fuel. Calorific Value – HCV and LCV. Theoretical calculations of calorific value by Dulong 's formula – Numerical problems.

Solid Fuels: Analysis of coal - Proximate and Ultimate analysis.

Liquid Fuels: Refining of Petroleum. Composition and uses of Gasoline, Diesel and Kerosene.

Gaseous Fuels: LPG, CNG -Composition and Uses. **Combustion:** calculation of air quantities by weight required for combustion of a fuel- Numerical problems.

Biodiesel: Sources, Concept of Trans esterification and carbon neutrality, Properties and significance.

UNIT –V GREEN CHEMISTRY & SPECTROSCOPY

Green Chemistry: Concept, Principles of Green Chemistry.

Spectroscopy: Description of Electromagnetic spectrum.

Principles of UV-Visible Spectroscopy: Statement of Beer-Lambert's law.

Absorption and intensity shifts: Bathochromic, Hypsochromic, Hyperchromic and Hypochromic shifts with one example each.

Principle and applications of UV-Visible Spectroscopy

IR Spectroscopy: Principles and applications of IR Spectroscopy.

NMR Spectroscopy: Principles of H ^{1}-NMR Spectroscopy, multiplicity, Chemical Shift. Principle and applications of MRI.

Text Books:

1. P.C. Jain & M. Jain, Engineering Chemistry, Dhan Patrai and sons Publishing Company, 17th Edn, New Delhi (2019)
2. Spectroscopy of Organic Compounds, P. S. Kalsi, *Spectroscopy of Organic Compounds*, New Age International Publishers, Latest Multicolour Edition, New Delhi (2022).
3. Instrumental Methods of Chemical Analysis, Gurdeep R. Chatwal & Sham Anand, *Instrumental Methods of Chemical Analysis*, Himalaya Publishing House, 5th Edn, Mumbai (2025)
4. Rama Devi, Venkata Ramana Reddy and P. Rath, Engineering Chemistry, CengageLearning, New Delhi (2016)
5. Puri and Sharma, Principles of Physical Chemistry, Vishal Publications Co.2019

Reference Books:

1. C. V. Agarwal, C. P. Murthy, A. Naidu, "Chemistry of Engineering Materials", WileyIndia, 5th Edition, 2013
2. R. P. Mani, K. N. Mishra, "Chemistry of Engineering Materials", Cengage Learning, 3rd Edition, 2015.

APPROVED ENGINEERING CHEMISTRY LAB SYLLABUS

Course code	Course Title						Core/Elective
U26CH2L1	ENGINEERING CHEMISTRY LAB						Core
Pre-requisites	Contact Hours Per Week				CIE	SEE	Credits
-	L	T	D	P			
	-	-	-	3	25	50	1.5

Course Objectives:

1. Conduct experiments, take measurements and analyze the data through hands-onexperience in order to demonstrate understanding of the theoretical concepts of quantitative analysis while working in small group.
2. Interpret the electro analytical principles with experimental results graphically.
3. Demonstrate writing skills through clear laboratory reports.

Course Outcomes:

1. Demonstrate the amount of Ferrous ions by volumetric analysis.
2. Calculate the total hardness and alkalinity of water.
3. Explain the mobility of ions in strong acids and weak acids using conductivity meter.
4. Compute the amount of Fe^{+2} and HCl by using potentiometer.
5. Infer Beer- Lambert's law by Colorimetry and demonstrate the synthesis of Aspirin and paracetamol.

Desirable / Advanced Course Outcomes

1. Analyze data critically and draw meaningful conclusions from experimental results.
2. Relate laboratory findings to industrial, environmental, and medical fields.

LIST OF EXPERIMENTS

Introduction to Chemical Analysis.

Techniques of Weighing.

VOLUMETRIC ANALYSIS:

1. Determination of strength of Ferrous solution by Dichrometry.
2. Determination of strength of Ferrous solution by Permanganometry.
3. Determination of hardness of water by Complexometric method using EDTA.
4. Determination of strength of Carbonates and bicarbonates in a given mixture.

INSTRUMENTAL ANALYSIS:

Conductometer:

5. Determination of strength of given HCl solution
6. Determination of strength of CH_3COOH solution
7. Determination of strength of HCl & CH_3COOH in given mixture

Potentiometer:

8. Determination of strength of HCl solution
9. Determination of strength of Ferrous solution.

pH Meter:

10. Determination of strength of HCl solution

Colorimeter:

11. Verification of Beer-Lambert 's law and determination of Permanganate.

CHEMICAL KINETICS:

12. Determination of rate constant of acid catalyzed hydrolysis of methyl acetate.

DRUG SYNTHESIS:

13. Synthesis of Drug-Aspirin & Paracetamol.

(1) (2) (3) (4) 29/4/22 (Dr R Gopalan) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)

ANNEXURE - IV
APPROVED ENVIRONMENTAL SCIENCES SYLLABUS

Course Code	Course Title						Core / Elective
U26CH102	ENVIRONMENTAL SCIENCES (Common to all Branches)						Core
Prerequisite	Contact Hours Per Week				CIE	SEE	Credits
	L	T	D	P			
-	2	-	-	-	40	60	-

Course Objectives:

1. To create awareness and impart basic knowledge about the various types of natural resources.
2. To know the functions of ecosystems.
3. To understand importance of biological diversity.
4. To study different pollutions and the impact on environment.
5. To know social and environment related issues and their preventive measures.

Course Outcomes:

After completing this course, the student will be able to:

1. Recognize the environmental science is interdisciplinary and need for sustainable development
2. Explain the role of ecosystems to preserve ecological balance.
3. Determine the importance and conservation strategies for biodiversity.
4. Illustrate the sources and effects of pollution and suggest appropriate preventive measures.
5. Categorize how environmental problems affect society and propose suitable strategies for efficient disaster management

Desirable / Advanced Course Outcomes

1. Design sustainable environmental management practices and recommend innovative solutions to address local and global environmental challenges using interdisciplinary approaches.
2. Evaluate environmental policies, disaster management strategies, and conservation programs to propose effective measures for sustainable resource utilization and environmental protection.

UNIT 1:

The Multidisciplinary Nature of Environmental Studies: Definition, scope and importance, need for public awareness.

Natural Resources:

Water Resources – Use and over utilization of surface and ground water, flood, drought, conflicts over water, Dams: Benefits and Problems.

Food Resources –World Food Problems, effects of modern agriculture, fertilizer-pesticides problems, water logging, salinity.

Forest Resources – Use and over exploitation, deforestation & its effect on tribal people.

Land Resources –Land Degradation, environmental effect of mining, man induced landslides, soil erosion and desertification.

Energy Resources –Renewable and Non- renewable energy resources.

UNIT 2:

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in ecosystem, food chains, ecological pyramids, ecological succession, types of ecosystems (marine, river, forest, grassland).

UNIT 3:

Biodiversity: Levels of Biodiversity, Bio-geographical classification of India, Value of biodiversity, Threats to biodiversity, endangered and endemic species of India, Conservation of biodiversity, global and national efforts.

UNIT 4:

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, water pollution, soil pollution, solid waste management.

Environment Protection Act: Air, water, forest and wildlife Acts, issues in the enforcement of environmental legislation

Sustainable Development Goals: Definition, Sustainable Goals [SDG6,SDG6 SDG7 SDG11 & SDG 15] Threats, Strategies to achieve sustainable development.

UNIT 5:

Social Issues and the Environment: Watershed management and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

Environmental Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle and disaster management in India.

Field Work:

- Visit to a local area to document environmental issues – agricultural area/ lake /terrestrial ecosystem.
- Visit to a local polluted area-market/slum area/Industrial area/traffic area.

Textbooks

1. Erach Bharucha, Environmental Studies for undergraduate courses, 4th edition, Universities Press.
2. R. Rajagopalan, Environmental Studies from crisis to cure, 4th edition, oxford Publication.

Reference Books:

1. A.K. De, Environmental Chemistry, 3rd Edition,Wiley Eastern Ltd.
2. E. P. Odum, Fundamentals of Ecology, 5th Edition,W. B. Sunders Co., USA.
3. M.N. Rao and A.K. Datta, Revised 3rd Edition,Waste Water Treatment, Oxford and IBK Publications.
4. Benny Joseph, Environmental Studies, 3rd Edition,Tata McGraw Hill, 2018.
5. V.K. Sharma, Disaster Management, National Centre for Disaster Management, IIPE, 2013.

APPROVED ENVIRONMENTAL SCIENCES SYLLABUS

Course Code	Course Title						Core / Elective
U26CH202	ENVIRONMENTAL SCIENCES (Common to all Branches)						Core
Prerequisite	Contact Hours Per Week				CIE	SEE	Credits
	L	T	D	P			
-	2	-	-	-	40	60	-

Course Objectives:

1. To create awareness and impart basic knowledge about the various types of natural resources.
2. To know the functions of ecosystems.
3. To understand importance of biological diversity.
4. To study different pollutions and the impact on environment.
5. To know social and environment related issues and their preventive measures.

Course Outcomes:

After completing this course, the student will be able to:

1. Recognize the environmental science is interdisciplinary and need for sustainable development
2. Explain the role of ecosystems to preserve ecological balance.
3. Determine the importance and conservation strategies for biodiversity.
4. Illustrate the sources and effects of pollution and suggest appropriate preventive measures.
5. Categorize how environmental problems affect society and propose suitable strategies for efficient disaster management.

Desirable / Advanced Course Outcomes

1. Design sustainable environmental management practices and recommend innovative solutions to address local and global environmental challenges using interdisciplinary approaches.
2. Evaluate environmental policies, disaster management strategies, and conservation programs to propose effective measures for sustainable resource utilization and environmental protection.

UNIT 1:

The Multidisciplinary Nature of Environmental Studies: Definition, scope and importance, need for public awareness.

Natural Resources:

Water Resources – Use and over utilization of surface and ground water, flood, drought, conflicts over water, Dams: Benefits and Problems.

Food Resources –World Food Problems, effects of modern agriculture, fertilizer-pesticides problems, water logging, salinity.

Forest Resources – Use and over exploitation, deforestation & its effect on tribal people.

Land Resources –Land Degradation, environmental effect of mining, man induced landslides, soil erosion and desertification.

Energy Resources –Renewable and Non- renewable energy resources.

UNIT 2:

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in ecosystem, food chains, ecological pyramids, ecological succession, types of ecosystems (marine, river, forest, grassland).

UNIT 3:

Biodiversity: Levels of Biodiversity, Bio-geographical classification of India, Value of biodiversity, Threats to biodiversity, endangered and endemic species of India, Conservation of biodiversity, global and national efforts.

UNIT 4:

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, water pollution, soil pollution, solid waste management.

Environment Protection Act: Air, water, forest and wildlife Acts, issues in the enforcement of environmental legislation

Sustainable Development Goals: Definition, Sustainable Goals [SDG6,SDG6 SDG7 SDG11 & SDG 15] Threats, Strategies to achieve sustainable development..

UNIT 5:

Social Issues and the Environment: Watershed management and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

Environmental Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle and disaster management in India.

Field Work:

- Visit to a local area to document environmental issues – agricultural area/ lake / terrestrial ecosystem.
- Visit to a local polluted area-market/slum area/Industrial area/traffic area.

Textbooks

1. Erach Bharucha, Environmental Studies for undergraduate courses, 4th edition, Universities Press.
2. R. Rajagopalan, Environmental Studies from crisis to cure, 4th edition, oxford Publication.

Reference Books:

1. A.K. De, Environmental Chemistry, 3rd Edition,Wiley Eastern Ltd.
2. E. P. Odum, Fundamentals of Ecology, 5th Edition,W. B. Sunders Co., USA.
3. M.N. Rao and A.K. Datta, Revised 3rd Edition, Waste Water Treatment, Oxford and IBK Publications.
4. Benny Joseph, Environmental Studies, 3rd Edition, Tata McGraw Hill, 2018.
5. V.K. Sharma, Disaster Management, National Centre for Disaster Management, IIPE, 2013.