

COURSE INFORMATION SHEET

Course code: CE24101

Course title: ENVIRONMENTAL SCIENCE

Pre-requisite(s): NA

Co- requisite(s): NA

Credits: 2 L:2 T:0 P:0

Class schedule per week: 2

Class: B.Tech.

Semester / Level: 1 & 2/ 1

Branch: All

Name of Teacher:

Course Objectives

This course enables the students:

| | |
|---|---|
| 1 | To develop basic knowledge of ecological principles and their applications in environment. |
| 2 | To identify the structure and composition of the spheres of the earth, the only planet sustaining life. |
| 3 | To analyse, how the environment is getting contaminated and probable control mechanisms for them. |
| 4 | To generate awareness and become a sensitive citizen towards the changing environment. |

Course Outcomes

After the completion of this course, students will be:

| | |
|---|--|
| 1 | Able to explain the structure and function of ecosystems and their importance in the holistic environment. |
| 2 | Able to identify the sources, causes, impacts and control of air pollution. |
| 3 | Able to distinguish the various types of water pollution happening in the environment and understand about their effects and potential control mechanisms. |
| 4 | Able to judge the importance of soil, causes of contamination and need of solid waste management. |
| 5 | Able to know the impacts of noise pollution and its management |

Syllabus

Module 1. Ecosystem and Environment

[6 L]

Concepts of Ecology and Environmental science, ecosystem: structure, function and services, Biogeochemical cycles, energy and nutrient flow, ecosystem management. Concept of Biodiversity.

Module 2: Air Pollution

[6 L]

Structure and composition of unpolluted atmosphere, classification of air pollution sources, types of air pollutants, effects of air pollution, monitoring of air pollution, Air pollution control and management.

Module 3: Water Pollution

[6 L]

Water Resource; Water Pollution: types and Sources of Pollutants; effects of water pollution; Water quality monitoring, Water quality index, water and wastewater treatment: primary, secondary and tertiary.

Module 4: Soil Pollution and Solid Waste Management

[6 L]

Soil profile, soil properties, soil pollution, Municipal solid waste management. MSW – Functional elements of MSW.

Module 5: Noise Pollution

[6 L]

Noise pollution: introduction, sources, outdoor and indoor noise propagation, Effects of noise on health, criteria noise standards and limit values, Noise measurement techniques, prevention and control of noise pollution.

Text books:

1. A, K. De. (3rd Ed). 2008. Environmental Chemistry. New Age Publications India Ltd.
2. R. Rajagopalan. 2016. Environmental Studies: From Crisis to Future by, 3rd edition, Oxford University Press.
3. Eugene P. Odum. 1971. Fundamentals of Ecology (3rd ed.) - WB Saunders Company, Philadelphia.
4. C. N. Sawyer, P. L. McCarty and G. F. Parkin. 2002. Chemistry for Environmental Engineering and Science. John Henry Press.
5. S.C. Santra. 2011. Environmental Science. New Central Book Agency.

Reference books:

1. D.W. Conell. Basic Concepts of Environmental Chemistry, CRC Press.
2. Peavy, H.S, Rowe, D.R, Tchobanoglous, G. Environmental Engineering, Mc-Graw - Hill International
3. G.M. Masters & Wendell Ela. 1991. Introduction to Environmental Engineering and Science, PHI Publishers.

Gaps in the syllabus (to meet Industry/Profession requirements)

POs met through Gaps in the Syllabus

Topics beyond syllabus/Advanced topics/Design

POs met through Topics beyond syllabus/Advanced topics/Design

| Course Delivery methods | |
|---|---|
| Lecture by use of boards/LCD projectors/OHP projectors | ✓ |
| Tutorials/Assignments | ✓ |
| Seminars | ✓ |
| Mini projects/Projects | ✓ |
| Laboratory experiments/teaching aids | ✓ |
| Industrial/guest lectures | ✓ |
| Industrial visits/in-plant training | ✓ |
| Self- learning such as use of NPTEL materials and internets | ✓ |
| Simulation | ✓ |

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

| Assessment Tool | % Contribution during CO Assessment |
|---------------------------|--|
| Mid Sem Examination Marks | 25 |
| End Sem Examination Marks | 50 |
| Quiz (s) (1 & 2) | 10+10 |
| Teacher's assessment | 5 |

| Assessment Components | CO1 | CO2 | CO3 | CO4 | CO5 |
|------------------------------|------------|------------|------------|------------|------------|
| Mid sem exam | ✓ | ✓ | ✓ | | |
| End Sem Examination Marks | ✓ | ✓ | ✓ | ✓ | ✓ |
| Quiz 1 | ✓ | ✓ | | | |
| Quiz 2 | | | ✓ | ✓ | ✓ |
| Assignment | ✓ | ✓ | ✓ | ✓ | ✓ |

Indirect Assessment –

1. Student Feedback on Faculty
2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Graduate Attributes

| Course Outcome # | Program outcomes | | | | | | | | | | | | Program specific outcomes | | |
|------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | | 1 | 3 | | | 1 | 3 | | | | | | 1 | | |
| 2 | | 1 | 3 | | | 1 | 3 | | | | | | 1 | | |
| 3 | | 1 | 3 | | | 1 | 3 | | | | | | 1 | | |
| 4 | | 1 | 3 | | | 1 | 3 | | | | | | 1 | | |
| 5 | | 1 | 3 | | | 1 | 3 | | | | | | 1 | | |

| Mapping Between COs and Course Delivery (CD) methods | | | |
|--|---|----------------|------------------------|
| CD | Course Delivery methods | Course Outcome | Course Delivery Method |
| CD1 | Lecture by use of boards/LCD projectors/OHP projectors | CO1 | CD1, CD2, CD8 |
| CD2 | Tutorials/Assignments | CO2 | CD1, CD2, CD8 |
| CD3 | Seminars | CO3 | CD1, CD2, CD8 |
| CD4 | Mini projects/Projects | CO4 | CD1, CD2, CD8 |
| CD5 | Laboratory experiments/teaching aids | CO5 | CD1, CD2, CD8 |
| CD6 | Industrial/guest lectures | | |
| CD7 | Industrial visits/in-plant training | | |
| CD8 | Self- learning such as use of NPTEL materials and internets | | |
| CD9 | Simulation | | |