

SCHOOL OF ENGINEERING

SWARNIM STARTUP & INNOVATION UNIVERSITY

Course	Bachelor of Engineering.
Duration	4 Years.
Aim	To be a knowledge nerve center in civil engineering education, research, entrepreneurship and industry outreach services for creating sustainable infrastructure and enhancing quality of life.
Objective	<p>Apply principles of basic and engineering sciences in analysis, design and operation of civil engineering systems.</p> <p>Assess societal needs and plan suitable infrastructure</p> <p>Analyze and design components of civil engineering projects</p> <p>Develop team spirit and inter personal dynamics for effective execution and management of projects.</p> <p>Engage in lifelong learning and adapt to changing professional and societal needs.</p>
Course Outcome	<p>At the end of the program, the student will be able to,</p> <ul style="list-style-type: none">• Engineering knowledge: knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.• Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems.• Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.• Modern tool usage: Create, select, and appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.• Ethics: Ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.• Project management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL STUDIES

CODE: 23000006

B.E. 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
2	-	-	2	2	30	50	70	-	150

Objectives: - This course on the environment is unlike any other. It is not only a collection of facts or information about the environment. It is about the way we all should live. It is expected to give you information about the environment that will lead to a concern for your own environment. When you develop this concern, you will begin to act at your own level to protect the environment we all live in. This is the objective of the course and the syllabus is a framework on which we must all realign our lives.

Prerequisites: - Environmental Studies

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	The Multidisciplinary Nature of Environmental Studies	2
2	Natural Resources	8
3	Ecosystems	4
4	Environmental Pollution	6

Learning Outcomes: - There is the need to create a concern for our environment that will trigger pro-environmental action; including activities we can do in our daily life to protect it.

Teaching & Learning Methodology: - The Syllabus for Environmental Studies includes classroom teaching. The syllabus is divided into four units covering 20 lectures. The units are classroom teaching based to enhance knowledge skilled and attitude to environment.

Content:

Sr. No.	Topics	Teaching Hrs.
Unit 1	Multidisciplinary nature of environmental studies : 1) Definition , 2) Scope and importance, 3)Need for public awareness a. Institutions in Environment b. People in Environment	03
Unit 2	Natural Resources a. Renewable & Nonrenewable Resources: Renewable Resources, Nonrenewable Resources, Destruction versus Conservation b. Water Resources: Water Resources-Indian Scenario, Water Sources- Surface & Ground Water Sources, Uses & overuses of water resources, problems due to Overexploitation of Water Resources c. Forest Resources : Forest Resources - Indian Scenario, Importance of forests- Ecologically & Economically, Uses of forest products, Forest Types, Deforestations-Causes and effects, Forest Degradation in India d. Energy Resources : Energy Resources - Indian Scenario, Conventional Energy Sources & its problems, non-conventional energy sources-Advantages & its limitations, Problems due to Overexploitation of Energy Resources	05
Unit 3	Ecosystems : a. Concepts of an ecosystem- structure & function of ecosystem b. Components of ecosystem- Producers, Consumers, Decomposers c. Bio-Geo- Chemical Cycles- Hydrological Cycle, carbon cycle, Oxygen Cycle, d. Nitrogen Cycle, Sulfur Cycle e. Energy Flow in Ecosystem f. Food Chains: Grazing, Detritus, & Food webs g. Ecological Pyramids h. Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic i. Ecosystem, Estuarine Ecosystem	06

Unit 4	<p>Environmental Pollution</p> <p>a. Air pollution, b. Water pollution, c. Soil pollution, d. Marine pollution, e. Noise pollution, f. Thermal pollution, g. Nuclear hazards</p> <ul style="list-style-type: none"> • Solid waste Management: Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution. • Pollution case studies. • Disaster management: floods, earthquake, cyclone and landslides. 	06
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Books Recommended:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies: R. Rajagopalan, Oxford University Press
3. Environmental Pollution: Causes, Effects & Control by K.C Agrawal
4. Environmental Science by Richard T Wright & Bernard J Nebel
5. Environmental Science by Daniel B Botkin & Edward A Keller
6. Environmental Engineering & Management by Suresh K Dameja
7. Environmental Management by Dr. Swapan C Deb
8. Environment & Ecology by Dr Gourkrishna Dasmohapatra
9. Introduction to Environmental Engineering and Science by Master Gilbert M.

E-Resources:

1. <http://nptel.ac.in>

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ELEMENTS OF CIVIL ENGINEERING

CODE: 23000015

B.E. 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	0	2	6		30	50	70	-	150

Objectives: -To have knowledge of basic of civil engineering.

Prerequisites: -Knowledge of physics and mathematics up to 12 science level.

Course outline: -

Sr.No.	Course Contents	Number of Hours
1	Introduction	04
2	Surveying, Leveling and Mapping	15
3	Building Materials and Construction	05
4	Building Planning and Drawing	06
5	Water Resources	03
6	Transportation Engineering	07

Learning Outcomes:-After learning the course the students shall be able to

1. Carry out simple land survey to prepare maps with existing details.
2. Find out area of irregular shaped plane figures.

3. Understand building plan elevation and section.
4. Get acquainted with construction materials.
5. Get acquainted with hydrological cycle and hydraulic structures.
6. Get acquainted with mass transportation systems.

Content:

Sr.No.	Topics	Teaching Hrs.
1	<p>Introduction: Branches of Civil Engineering, Scope of Civil Engineering, Role of Civil Engineer in Society. Impact of infrastructural development on economy of country.</p>	04
2	<p>Surveying, Leveling and Mapping: Introduction: Definition of Surveying, Aims and applications, Fundamental principles of surveying, Classification of surveying, Plans and maps, Scales, Units of measurement.</p> <p>Linear Measurement: Methods, Instruments used in chain surveying, Selection of stations, Chaining, Ranging, Offsetting, Errors in chaining and correction, Conventional symbols.</p> <p>Angular Measurement: Instruments used, Types of compass, Types of meridians and bearings, Measurement of bearings, computation of angles. Compass traversing and correction of bearings for local attraction.</p> <p>Leveling: Aims and applications, Definition of various terms, Instruments for leveling, Methods of leveling, Recording observations in level-book, Computing reduced levels by HI and rise & fall method, Definition of contour, Characteristics of contours of different terrains and application of contour maps, Introduction to planimeter, introduction to Global positioning system(GPS), remote sensing(RS) and Geographical information system(GIS)</p>	03 03 04 05
3	<p>Building Materials and Construction: Materials: Introduction to construction materials like Stone, Bricks, Lime, Cement, Timber, Sand, Aggregates, Mortar, Concrete and bitumen.</p> <p>Construction: Classification of buildings, Types of loads acting on buildings, Building components and their functions and nominal dimensions.</p>	02 03

4	Building Planning and Drawing: Definition and concept of plan of a simple residential building, Elementary principles and basic requirements for building planning, elevation and section of a residential building.	06
5	Water Resources: Hydrologic cycle, water use and its conservation, Introduction to dams, weirs, barrages and check dams.	03
6	Transportation Engineering: Role of transportation in national development, Modes of transportation, Introduction to road traffic and traffic control, Introduction to mass transportation system.	07

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics

Books Recommended:

1. Surveying Vol. I Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain 16th Edition Publisher: Laxmi Publication Delhi
2. Surveying Theory and Practice (7th Edition) Author: James M Anderson and Edward M Mikhail Publisher: McGraw Hill Education, India Pvt. Ltd.
3. Surveying and Leveling Author: R. Subramanian Publisher: Oxford University
4. Surveying and Leveling Author: N. N. Basak Publisher: Tata McGraw Hill Education, Pvt. Ltd. New Delhi
5. Surveying Vol. I Author: S. K. Duggal Publisher: Tata McGraw Hill Publication New Delhi
6. Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha Publisher: McGraw Hill Education, India Pvt. Ltd.
7. Building drawing Author: M.G.Shah, C.M.Kale and S.Y.Patki Publisher: Tata McGraw Hill
8. Civil Engg. Drawing Author: S. C. Rangwala Publisher: Charotar Pub. House Anand
9. Building Construction Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain Publisher: Laxmi Pub. Delhi
10. Building Construction and Construction Material Author: G.S.Birdie and T.D. Ahuja Publisher: Dhanpat Rai Publishing Company

E-Resources:

<http://nptel.ac.in/course.php?disciplineid=105>

Practical List:-

Sr. No.	Practical
1	Chain survey
2	Compass survey
3	Leveling

Project:

Based on practical students shall perform following projects.

1. Chain and compass survey project
2. Profile leveling and contouring

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SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL

ENVIRONMENT CONSERVATION & HAZARD MANAGEMENT

CODE: 2200010

B.E. 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
3	-	-	3	3	30	50	70	-	150

Objectives: - To provide a comprehensive knowledge for awareness of environment conservation and hazard management.

Prerequisites:- Environment Conservation & Hazard Management

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Ecology and Environment	6
2	Solar power	10
3	Seismic engineering and disaster management	6
4	Sustainable development	8

Learning Outcomes:- At the closing stage of the course, the students will be able to understand the importance of environment conservation and the concepts of hazard management.

Teaching & Learning Methodology:- The Syllabus for Environmental Studies includes classroom teaching. The syllabus is divided into four units covering 30 lectures. The units are classroom teaching based to enhance knowledge skilled and attitude to environment.

Books Recommended:

1. R. R. Mahitcha – “Environment Conservation and Hazard Management”, Atul Prakashan.
2. Solanki and Chetan Singh – “Renewable Energy Technologies”, PHI Learning.
3. Izrael Y.A. – “Ecology and Control of the Natural Environment”, Kluwer Academic Publisher.
4. Sharma, Sanjay K. – “Environment Engineering and Disaster Management”, Laxmi Publications.
5. Earnest, Joshua and Wizelius, Tore – “Wind Power Plants and Project Development, PHI Learning.
6. Anandita Basak – “Environmental Studies”, Pearson Publication.
7. K. S. Valadia – “Coping with Natural Hazards Indian Context”, Orient Longman Publication.
8. Edward S. Rubin – “Engineering and Environment”, McGraw Hill Publication

SYLLABUS

Unit-1

Ecology and Environment: Importance of environment and scope, Engineering and Environment issues, The natural system, Biotic and Biotic components and processes of natural system, Eco system, Food chain, webs and other biological Systems, Causes of environmental pollution, Pollution due to solid waste, Water pollution, Air pollution, The noise as pollution, Pollution of land due to industrial and chemical waste, Radiation and its effects on vegetables and animals

Unit-2

Solar power: Features of solar thermal and PV systems, Types of solar cookers and solar water heaters, Solar PV systems and its components and their working, Types of solar PV cells, Rating and Costing.

Unit-3

Seismic engineering and disaster management: Introduction of Seismic engineering and its application, Features of disasters such as floods, Earthquakes, Fires, Epidemics, Gas/radioactive leaks etc., Management and Mitigation of disasters.

Unit-4

Sustainable development: Concept of sustainable development, Natural resources, Abiotic and Biotic resources, Principles of conservation of energy and management, Need of renewable energy, Growth of renewable energy in India and the world, Concept of waste management and recycling.