

Branch Name:	COMPUTER ENGINEERING / INFORMATION TECHNOLOGY / ARTIFICIAL INTELLIGENCE AND DATA SCIENCE / INFORMATION AND COMMUNICATION TECHNOLOGY
Program Code:	ET103 / ET105 / ET108/ET107
Course Title:	Elements of Civil and Mechanical Engineering
Course Code:	2ET1000106T
Pre-requisite Course:	Basic knowledge of mathematics and physics

Course Objectives:

1. The students will learn fundamental basics of Civil and Mechanical Engineering concepts.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Unit No	Topic	Total Hours	Weightage (%)
1	Introduction: Basic definition, Branches and scope of civil Engineering, Impact of infrastructural development on economy of country.	2	5
2	Surveying: Definition, objectives and application, principles of surveying, methods of surveying, Instruments used in surveying- chain survey, compass, theodolite, total station and drone survey.	6	15
3	Structural & Geotechnical Engineering: Types of structures, Types of Soils, Types of Foundations, Soil-structure interaction, Advanced techniques.	3	5
4	Building construction and planning: Classification of building, building components and their function, principles of planning. Green building: Introduction, Objectives, Fundamental Principles, Benefits of Green Buildings, Example of Green Buildings. Green ratings Smart cities: Terminology, characteristics, frameworks, technologies for design of smart city, smart cities of India	6	15
5	Water Resources Engineering: Hydrologic cycle, water use and its conservation, Introduction to dams, weirs, barrages and check dams. Basics of Irrigation Engineering. Transportation Engineering: Modes of transportation, Mass Transportation systems-BRTS, Metro, monorail, traffic control devices	4	10
6	Mechanical Elements : Prime movers and its types, Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific heat capacity, Change of state, Path, Process, Cycle, Internal energy, Enthalpy, Statements of Zeroth Law and First law of thermodynamics.	08	18
7	Internal Combustion Engines: Introduction, Classification, Engine details, four-stroke/ two-stroke cycle Petrol/Diesel engines, Indicated power, Brake Power, Efficiencies.	07	15
8	Steam Boilers: Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox boiler, Functioning of different mountings and accessories.	06	17

Reference Books:

1. Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha. Publisher: McGraw Hill Education, India Pvt. Ltd.
2. Surveying Vol. I Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar. Publisher: Laxmi Publication Delhi.
3. Building Construction Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain. Publisher: Laxmi Pub. Delhi.
4. Building Information Modeling: Global & Indian Perspective Author: Dr. Adv. Harshul Savla, Dr. Chandrashaun Chavan, Ar. Pallavi Patil. Publisher: Notion Press, India.
5. Introduction to Smart Cities Author: Anil Kumar. Publisher: Pearson India.
6. Basic Mechanical Engineering by Pravin Kumar, Pearson
7. Elements of Mechanical Engineering by: P. S Desai and S.B.soni
8. Elements of Mechanical Engineering by Sadhu Singh S. Chand Publication
9. Elements of Mechanical Engineering by S.M.Bhatt

Course Learning Outcomes (CLO):

1. Overview of Civil Engineering field.
2. Idea about surveying and different types of instruments.
3. Basic idea about building construction and green building,
4. Get acquainted with BIM and smart cities.
5. To understand the fundamentals of mechanical systems.
6. To understand and appreciate significance of mechanical engineering in different fields of engineering.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Overview of Civil Engineering field.	L-1 and L-2
CLO2	Idea about surveying and different types of instruments.	L-3
CLO3	Basic idea about building construction and green building,	L4
CLO4	Get acquainted with BIM and smart cities.	L2
CLO5	To understand the fundamentals of mechanical systems.	L2
CLO6	To understand and appreciate significance of mechanical engineering in different fields of engineering.	L2

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with POs & PSOs

	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CLO1	M			M	M				M			M	M		
CLO2	M	M	H		M			M	M		M	M	M		M
CLO3	M	M	M		M			M	M		M	M	M		M
CLO4	M	M	H		M			M	M		M	M	M		M
CLO5	M	M	M		M			M	M		M	M	M		
CLO6	M				M	M	M						M		

H: High, M: Medium, L: Low