

Branch Name:	Electrical Engineering
Program Code:	ET109
Course Name:	ELEMENTS OF CIVIL & MECHANICAL ENGINEERING
Course Code:	1ET1000106
Pre-requisite Course:	Basic Knowledge of mathematics and physics

Course Objective:

- The students will learn fundamental basics of Civil and Mechanical Engineering concepts.
- Students will understand the fundamentals of mechanical systems.
- Apply and appreciate significance of mechanical engineering in different fields of engineering.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)								
Lecture	Tutorial	Practical	Credit	Theory				Practical				Total
				University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	-	2	4	28	70	12	30	-	-	08	20	120

Course Contents			
Sr. No	Topic	Total Hours	Weight (%)
01	Introduction: Basic definition, Branches of Civil Engineering.	01	2
02	Surveying: Basic definition, objectives and applications, Fundamental principles of surveying, geodetic survey and plane survey, Classification of surveying, Plans and maps, Scales. Introduction of Chain and Compass survey, Leveling and Contour survey, Instruments used, Conventional symbols.	09	23
03	Building Construction and Planning : Classification of buildings, Building components and their function, Plan – elevation – section of a simple residential building. Water Resources : Elements of Hydrology, Sources of water, water requirement and its conservation. Introduction of Hydraulic structures (Dam, weir, barrage). Transportation Engineering : Modes of transportation, Traffic control devices, Introduction to mass transportation system (BRTS, Metro and Monorail).	11	25
04	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.	07	20
05	Internal Combustion Engines: Introduction, Classification, Engine details, four-stroke/two-stroke cycle Petrol/Diesel engines, Indicated power, Brake Power, Efficiencies.	07	15
06	Steam Boilers: Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox boiler, Functioning of different mountings and accessories.	07	15

List of References:

1. Surveying Vol. I Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar: Laxmi Publication Delhi .
2. Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha Publisher: McGraw Hill Education, India Pvt. Ltd.
3. Building drawing Author: M.G. Shah, C.M. Kale and S.Y. Patki Publisher: Tata McGraw Hill.
4. Building Construction Author: Dr. B.C. Punmia, Ashokkumar Jain, Arunkumar Jain Publisher: Laxmi Pub. Delhi
5. Irrigation Engineering and Hydraulic Structures Author: Santoshkumar Garg Publisher: Khanna Publishers Delhi .
6. Highway Engineering Author: Khanna S.K. and Justo C.E.G. Publisher: Nemchand and Brothers.
7. Basic Mechanical Engineering by Pravin Kumar, Pearson
8. Elements of Mechanical Engineering by P.S. Desai and S.B. Soni
9. Elements of Mechanical Engineering by Sadhu Singh S. Chand Publication
10. Elements of Mechanical Engineering by S.M. Bhatt

List of Practicals:

1. Chain survey and Compass survey
2. Leveling
3. To understand construction and working of various types of boiler.
4. To understand construction and working of different boiler mountings and accessories.
5. To determine brake thermal efficiency of an I. C. Engine.

Project:

Based on practical, students shall perform following projects.

1. Chain and compass survey.
2. Make the model of boiler and understand its working.

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

CLO	Description	Bloom's Taxonomy Level
CLO1	Discuss the various sources of energy and basic terminology of Mechanical engineering.	3 Applying 6 Creating
CLO2	Discuss working and applications of steam boilers and various energy conversion systems.	2 Understanding 3 Applying
CLO3	Analyze various heat engine cycles and understand construction and working of IC engines.	3 Applying 5 Evaluating
CLO4	Overview of Civil Engineering field.	2 Understanding
CLO5	Perform simple land surveying and map preparation.	2 Understanding 3 Applying
CLO6	Elementary knowledge of different materials and their application in construction and get acquainted with Water resources and transportation system	2 Understanding 3 Applying

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	M	M	H		H	M	H				H		H
CLO2	H	M	L								L			L
CLO3	L	H	H	M	M	H	M				M			M
CLO4	L					M							L	L
CLO5	L	M	M	M	M								M	M
CLO6	L	M	M	M			M						M	M

H:High, M:Medium, L:Low