21PCM104T					Elements of Engineering (Civil & Mechanical)					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

COURSE OBJECTIVES

- To impart basic knowledge on Civil and Mechanical Engineering.
- To explain the materials used for the construction of civilized structures.
- To make understand the fundamentals of construction of structure.
- Enable the students understand wide range of mechanical systems and their practical applications

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS 8 Hrs.

Surveying: Objects - types - classification - principles - measurements of distances - angles - levelling - determination of areas - illustrative examples. Civil Engineering Materials: Bricks - stones - sand - cement - concrete - steel sections.

UNIT II BUILDING COMPONENTS AND STRUCTURES 8 Hrs.

Foundations: Types, Bearing capacity - Requirement of good foundations. Superstructure: Brick masonry – stone masonry - beams - columns - lintels - roofing - flooring - plastering - Mechanics - Internal and external forces - stress - strain - elasticity - Types of Bridges and Dams - Basics of interior design and landscaping.

UNIT III BOILERS, COMPRESSORS AND TRANSMISSION SYSTEMS 8 Hrs.

Steam boilers and Reciprocating air compressors: Classification of boilers, essentialities of boilers, selection of different types of boilers, study of boilers, boiler mountings and accessories.

Reciprocating air compressors: uses of compressed air, work done in single stage and twos stage compression, inter cooling and simple problems.

Transmission systems: Belts - Ropes and chain: belt and rope drives, velocity ratio, slip, length of belt , open belt and cross belt drives, ratio of friction tensions, centrifugal tension in a belt, power transmitted by belts and ropes, initial tensions in the belt, simple problems.

UNIT IV INTERNAL COMBUSTION ENGINES 8 Hrs.

Internal combustion engines: classification of IC engines, basic engine components and nomenclature, working principle of engines, Four strokes and two stroke petrol and diesel engines, comparison of CI and SI engines, comparison of four stroke and two stroke engines, simple problems such as indicated power, brake power, friction power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency.

Max. 32 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1: Ability to explain the usage of construction material and proper selection of construction materials
CO2: Expose the students to surveying concepts and various civil engineering structures such as buildings, roads, bridges, dams etc.
CO3: Ability to identify the components use in boilers and compressors
CO4: To explain mechanical component suitable for the required power transmission
CO5: Ability to demonstrate working principles of petrol and diesel engine
CO6: Ability to explain the different components of CI and SI engines

TEXT/REFERENCE BOOKS

1. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, 1996.Hacker, Diana. Rules for Writers. 5thed. Boston: Bedford, 2004.
2. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. 1999.
3. Bailey, Stephen. Academic Writing: A practical guide for students. New York: Rutledge, 2011.
4. Seetharaman S., “Basic Civil Engineering”, Anuradha Agencies, 2005.
5. Venugopal K. and Prahu Raja V., “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, 2000.
6. Thermal Engineering, Ballaney, P.L., Khanna Publishers, 2003.
7. Elements of Mechanical Engineering, A.R. Asrani, S.M. Bhatt and P.K. Shah, B.S. Publs.
8. Elements of Mechanical Engineering, M.L. Mathur, F.S. Metha & R.P. Tiwari Jain Brothers Publs., 2009.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100	**Exam Duration: 3 Hrs.**
PART A: 10 Questions of 2 marks each-No choice	20 Marks
PART B: 5 Questions from each unit with internal choice, each carrying 16 marks	80 Marks