CH/CE/EC/ EE/ME113	BASIC CIVIL AND MECHANICAL ENGINEERING	L	T	P	C	Int	Ext
		3	-	-	3.0	30	70

Semester I [First Year]

COURSE OBJECTIVES:

To enable the circuit branch students to acquire fundamental knowledge in Civil and Mechanical Engineering disciplines for application-oriented concepts.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. Acquire knowledge of building terminology, surveying and building materials.
2. Understanding the components of building and other civil engineering structures.
3. Describe the various manufacturing process and power transmission elements.
4. Explain the basic principles of IC engines, refrigeration system and working of hydraulic machines.

UNIT I *Text Book - 1* [CO:1] **(12)**

Introduction to Civil Engineering: Civil Engineering Contributions to welfare of society, Terminology Plinth area, carpet area, Floor Area, Built-up area floor space index, types of buildings, Residential buildings, and Industrial buildingsSurveying; Measurement of distance, area using chain, angles measurement, Levelling with auto level (H I method)

Basic Engineering materials: (types and purposes or uses) Stones, Bricks, Timber, Cement, Sand, Steel, Tiles, Cement mortar, Plain Concrete, RCC, Prestressed concrete (PSC), Fiber Reinforced Concrete (FRC) Ferrocement, Glass, Bitumen, Paints, Distempers, Varnishes.

UNIT II *Text Book - 1* [CO:2] **(12)**

Building Components and its Functions: Building Plan, Setting out building, Footing types-suitability to structural, Plinth beam, Pest control for foundation.

Super Structure: Plinth level, DPC, Masonry, Plastering, Flooring, Roof, Door, Window, Ventilator, Lintels, Stairs.

Other structures (discussion purpose): road, culvert, bridge, Retaining wall, river, Water canal, storage of water(GLSR, ELSR), Diversion projects, Dam, catchment area, Airport- runway, railway line its components.

UNIT III *Text Book - 2* [CO:3] **(12)**

Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society - Manufacturing Process: Casting - Casting, Sand-Casting process, Introduction to various casting process. Welding - Classification, Working of the Simple Arc welding Process. Introduction to sheet metal - Introduction to Punching, Blanking, Drawing, Bending and Spinning operations.

Transmission of Power: Transmission of Power - Belt drives - Types of belts - Materials - Velocity Ratio - Ratio of Tensions - Slip in belts - length of an Open and Crossed belt drive - Simple problems in transmission of Power by Belt drives.

UNIT IV *Text Book - 2* [CO:4] **(12)**

I.C. Engines: Classification of I.C Engines - Components in I.C engine, working principle of SI & CI engines - Comparison of two stroke & four stroke engine and SI & CI engines - Applications.

Refrigeration & Air Conditioning Systems: Necessity and applications of refrigeration, unit of refrigeration and C.O.P, working principle of a simple vapour compression and vapour absorption refrigeration system.

Hydraulic Machines: Layout of a Hydro-electric Power Plant.

Turbines: Classification, construction and working of Pelton wheel turbine, Francis turbine and Kaplan turbine.

Pumps: construction and working of Reciprocating and Centrifugal pumps.

LEARNING RESOURCES:

TEXT BOOK(s):

1. S. S Bhavikatty - Basic Civil Engineering, New Age International Publishers, 2022.
2. Mathur, Mehta &Tewari - Elements of Mechanical Engineering, Dhanpath Rai & Sons, 13/E.

REFERENCE BOOK(s):

1. GG.Shanmugam, M.S.Palani Chamy - Basic civil and Mechanical Engineering, Mcgraw hill publication, Fourth edition.
2. Satheesh Gopi -Basic Civil Engineering, Pearson Publications, 2009, First Edition.
3. Ramamrutham S. - Basic Civil Engineering and Engineering Mechanics, Dhanpath Rai Publication published 2009.
4. Venugopal K. and Prahu Raja V. - Basic Mechanical Engineering, Anuradha Publishers, Kumbakonam, (2000).
5. Shantha Kumar S R J. - Basic Mechanical Engineering, Hi-tech Publications, Mayiladuthurai, (2000).