I Year I Semester	L	T	P	C
Code: 20ES1020	3	0	0	3

BASICS OF CIVIL AND MECHANICAL ENGINEERING

Course Objectives:
1. To understand the basic principles of Surveying.
2. To know about civil engineering materials required for building construction.
3. To learn working of IC Engines, turbines and Pumps
4. To learn how the belts can be used for power transmission
5. To learn about castings, welding processes and the basic operations on Lathe.

Course Outcomes: At the end of the Course, Students will be able to
1. Calculate areas and volumes
2. Identify good building materials
3. Get the knowledge about working principles of IC Engines, turbines and Pumps
4. Get the knowledge in power transmission through belts.
5. Recognize the different types of casting, forging, welding processes and working of Lathe.

Part – A: CIVIL ENGINEERING

UNIT–I

Overview of Civil Engineering: Civil Engineering contributions to the welfare of society,
Surveying: Objective, classification and principles of surveying; Measurements – distances, angles, Introduction to leveling, calculation of areas and volumes
Simple Stresses & Strains: Elasticity & Plasticity – Types of stresses and Strains – Hooke's law, Stress strain Diagram for Mild steel, Lateral strain, Poisson's Ratio.

UNIT–II: Building Materials & Building Components
Building Materials: Bricks, stones, cement, concrete, Steel, Timber- Properties and Uses.
BUILDINGS & COMPONENTS**:** Types of Buildings, Regulations and Building bye laws, Essential factors for planning of building, Requirements of Building, Introduction to Building components like Foundations, Columns, Beams and Slabs

Part – B: MECHANICAL ENGINEERING

UNIT–III: INTERNAL COMBUSTION ENGINES, TURBINES AND PUMPS

Introduction to Mechanical Engineering, - Internal Combustion Engines - Classification – Working principle of Petrol and Diesel Engines – Four stroke and two stroke engines
Turbines and Pumps – Layout of Hydroelectric power plant - Classification – working principles of Pelton wheel, Fancis turbine and Kaplan Turbine
Hydraulic pumps – Classification – working principle of reciprocating and centrifugal pumps

UNIT–IV: POWER TRANSMISSION SYSTEMS – Belt Drives

Power Transmission by Belts – classification – slip – creep – belt tension ratio – power transmission by belt – centrifugal tension – initial tension – efficiency – condition for maximum power

UNIT–V: MANUFACTURING PROCESSES

Manufacturing processes: Elementary ideas of Casting, Forging, Rolling, Welding, Soldering and Brazing.

Machining processes- Lathe – Classification - Turning - Taper turning - Thread cutting

Text Books:

1. Building Construction by Dr.B.C.Punimia, Ashok Kumar Jain
2. Theory of Surveying vol. I by S.K.Duggal.
3. Ganesan.V. Internal combustion engines*:* Tata Mcgraw-Hill Publishing Company Limited.
4. Theory of machines / Khurmi/S.Chand
5. Manufacturing Technology -Vol I- P.N. Rao- TMH

Reference Books:

1. Building Materials by Rangawala
2. Strength of Materials by Bansal
3. Thermal Engineering / RK Rajput/ Lakshmi Publications
4. Production Technology-P C Sharma-S. Chand

5 Mechanism and Machine Theory / JS Rao and RV Dukkipati / New Age