GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3

Environment Engineering

Subject Code 131304
Subject Name BASICS OF STRUCTURAL ENGINEERING

Sr.No	Course content
1.	Direct and bending stresses : Short columns subjected to eccentric load, middle third rule, kernel of section, Retaining walls, Masonary walls, Overview of long column, slenderness ratio
2.	Deflection of beams : Moment area method, Techniques to control deflections
3.	Moment Distribution Method : Overview of fixed end moments, Analysis of statically Indeterminate beams & plane frames.
4.	Concrete Technology : • Ingredient of concrete: Cement, Aggregate, Admixtures, Water. 1. Cement: Hydration mechanisms, Types of cement & their uses, Overview of physical properties and their tests as per IS and ASTM 2. Aggregate: Function, Types, Sieve analysis, size, Overview of physical tests as per IS & ASTM 3. Admixtures: Various types, Advantages and limitations relevant IS & ASTM • Mixing & Placing of Concrete, Various techniques of Curing, Hardened Concrete • Durability and permeability of Concrete: Definitions, Causes, Carbonation, Cracking, Creep, shrinkage, Crack width, Permeability. • Concrete in Aggressive Environment: Alkali aggregate Reaction, Sulphate Attack, Chloride attack, Acid attack. Special coating for them, Water proofing. Concrete for storing hot liquids.
5.	Soil Engineering : • General characteristics of different types of soil, Soil designation. • Particle size analysis as per BIS grading curves consistency limits • Geotechnical properties of soil : Permeability, Shearing strength, Compaction & Consolidation, Characteristics of soil and relevant test • Bearing capacity of soil mass : Shear failure and Settlement criteria. • Sub surface investigation : Planning of exploration programme,Field testing of soil. • Introduction to geosyenthesis and its application.

TERM WORK:

Term Work shall consist of atleast 12 problems based on the syllabus of Basics of structural engineering.
Presentation based on Concrete Technology .& soil Engineering

Reference Books:

1. Timoshenko & Gere ; *Mechanics of Materials*
2. S. Ramamrutham ; *Strength of Materials*
3. S. Ramamrutham ; *Theory of structures*
4. A.M.Neville ; *Properties of Concrete*
5. M.S.Shetty ; *Concrete Technology*
6. K.R.Arora ; *Soil Mechanics*
7. B.C.Punmia ; *Soil Mechanics*