1. Subject Code: **EN-201** Course Title: **Strength of Materials**

2. Contact Hours : L: 3 T: 0 P:2

3. Examination Duration (ETE) (Hrs.) : Theory 3 Hrs Practical 0 Hrs

4. Relative Weightage : CWS 15 PRS 25 MTE 20 ETE 40 PRE 0

5. Credits : 4

6. Semester : II

7. Subject Area : DCC

8. Prerequisite : NIL

9. Objectives : This course aims to describe the role of strength of materials. The aim of unit-1 is to study mechanical properties of materials and various types of stress and strains. The objective of unit-1 is to draw the shear force and bending moment diagrams. The aim of unit -3 is to calculate the deflection of the beam by various methods. The objective of unit-4 and unit-5 are to do the analysis of columns and torsion of the shaft.

10. Detail of Course:

S. No.	Contents	Contact Hours
1	**Stress and Strain:** Introduction, Mechanical properties, simple stress and stains, elastic constants, principal stress. Mohrs' circle, simple bending and shear of the beam.	7
2	**Bending Moment and Shear Force Diagrams:** Introduction, Shear force and bending moment diagrams of cantilever beams, simply supported beam, over hanging beams of different types of loadings.	10
3	**Deflection:** Introduction, Deflection due to bending, moment curvature relation, Double integration method, Macaulay's method, moment area method, and conjugate beam method.	10

4	**Columns and Struts:**Introduction, types of columns, Modes of failure of columns, Effective length, slenderness ratio, Eulers Theory, Rankines's theory.	7
5	Torsion of Shaft Introduction, Torsion of shafts: Introduction, Torsion of circular shafts, Assumptions, Resisting torque, Power transmitted, Design of shafts.	8
Total		**42**

11. Course Outcomes:

From unit-1, the student will learn the concept of mechanical properties of materials. Form unit-2. They will get knowledge of drawing the shear force and bending moment diagrams of beam. Unit-3, unit-4 & unit-5 give the concept of calculation of deflection of beam, column analysis and torsion of the shafts.

12. Suggested Books :

1. Mechanics of Materials, B. C. Punmia, Laxmi Publications
2. Strength of Materials, R. K. Rajput, S. Chand & Company
3. Strength of Materials, B. C. Punmia, Laxmi Publications

1. Subject Code: **EN-203** Course Title: **Engineering & Environmental Surveying**

2. Contact Hours : L: 3 T: 0 P: 2

3. Examination Duration (ETE) (Hrs.) : Theory 3 Hrs Practical 0 Hrs

4. Relative Weightage : CWS 15 PRS 25 MTE 20 ETE 40 PRE 0

5. Credits : 4

6. Semester : III

7. Subject Area : DCC

8. Pre-requisite : Nil

9. Objectives :

1. To introduce the definition, principle, importance and scope of surveying.
2. To introduce the Plane table surveying and leveling.
3. To introduce the different methods for the calculation of area and volume for plane and irregular boundaries.
4. To introduce the basic concepts of, types and operation of Theodolite.
5. To understand the principle and operation of Tacheometry surveying.

10. Details of Course

S. No.	Contents	Contact Hours
1.	**Introduction to Surveying:** Introduction: Object & scope of surveying, classification of Surveying, principles of surveying, surveying instructions, Basic Surveying Techniques: Chain Surveying ; Instruments of chain surveying, corrections to measured lengths, measurement of offsets, limiting length of offsets, field work of chain surveying, booking of field notes, conventional symbols, obstacles in chain surveying, errors in chain surveying & their corrections. Compass surveying: instructions in compass surveying, system of recording the bearing, determination of meridian compasses, traversing & graphical method of adjustment.	7
2.	**Plain table Surveying and Leveling:** Plane table Surveying: Plane table and its accessories, methods of plane tabling, two point problem, three point problems by different methods. Leveling: Introduction, types of leveling, leveling instruments, operations and adjustments of levels, ordinary leveling, errors of leveling, effect of earth's curvature and atmospheric refraction in leveling , precise leveling, modern leveling instruments, contouring: characteristics and uses of contour, modern methods of depicting relief on map.	9
3.	**Areas and Volume:** Areas , Volume and Earthquake Computations : Different methods of determination of areas from plan, areas of irregular boundaries, areas of field notes by latitudes and departure methods, instrumental methods of determining areas, areas of cross section, determination of earthquake volumes.	9

4.	**Theodolite Traversing:** Theodolite Traversing : Transit theodolites, operation and adjustment of theodolites, horizontal angle by the method of repetition and reiteration, permanent adjustments of theodolite, theodolite traversing, traverse computations, sources of errors, check in a traverse, closing error and its adjustments, omitted measurements.	9
5.	**Tacheometric Surveying:** Tacheometric surveying : principle of stadia method, instrument constants, Anallatic lens, Distance and elevation of stations, subtense method, tangential method, errors, subtense bar and its use.	8
Total		**42**

12.Suggested Books:

1. Agor, R, “Surveying”, Vol. I & II, Khanna Publications, Delhi.
2. Arora, K.R., “Surveying”, Vol. I & II, Standard Book House, Delhi.
3. Bannister, A. and Baker, R., “Solving Problems in Surveying”, Longman Scientific Technical, U.K..
4. Kennie, T.J.M. and Petrie, G., “Engineering Surveying Technology”, Blackie & Sons Ltd, London.
5. Punmia, B.C., “Surveying”, Vol. I & II, Laxmi Publications, New Delhi.

1. Subject Code: **EN-205** Course Title: **Environmental Chemistry & Microbiology**

2. Contact Hours : L: 3 T: 0 P: 2

3. Examination Duration (ETE) (Hrs.) : Theory 3 Hrs Practical 0 Hrs

4. Relative Weightage : CWS 15 PRS 25 MTE 20 ETE 40 PR 0

5. Credits : 4

6. Semester : III

7. Subject Area : DCC

8. Prerequisite : NIL