Syllabus for the Post of Assistant Professor

1. **STRUCTURAL ENGINEERING MECHANICS:** BENDING MOMENT AND SHEAR FORCE IN STATICALLY DETERMINATE BEAMS. SIMPLE STRESS AND STRAIN RELATIONSHIP: STRESS AND STRAIN IN TWO DIMENSIONS, PRINCIPAL STRESSES, STRESS TRANSFORMATION, MOHR'S CIRCLE. SIMPLE BENDING THEORY, FLEXURAL AND SHEAR STRESSES, UNSYMMETRICAL BENDING, SHEAR CENTRE. THIN WALLED PRESSURE VESSELS, UNIFORM TORSION, BUCKLING OF COLUMN, COMBINED AND DIRECT BENDING STRESSES.

2. **STRUCTURAL ANALYSIS:** ARCHES, BEAMS, CABLES AND FRAMES, DISPLACEMENTS IN STATICALLY DETERMINATE STRUCTURES AND ANALYSIS OF STATICALLY INDETERMINATE STRUCTURES BY FORCE/ ENERGY METHODS, ANALYSIS BY DISPLACEMENT METHODS (SLOPE DEFLECTION AND MOMENT DISTRIBUTION METHODS), INFLUENCE LINES FOR DETERMINATE AND INDETERMINATE STRUCTURES. BASIC CONCEPTS OF MATRIX METHODS OF STRUCTURAL ANALYSIS. CONCRETE STRUCTURES:

3. **CONCRETE STRUCTURES-** PROPERTIES OF CONCRETE, BASICS OF MIX DESIGN. CONCRETE DESIGN- BASIC WORKING STRESS AND LIMIT STATE DESIGN CONCEPTS, ANALYSIS AND DESIGN OF MEMBERS SUBJECTED TO FLEXURE, SHEAR, COMPRESSION AND TORSION BY LIMIT STATE METHODS. BASIC ELEMENTS OF PRESTRESSED CONCRETE, ANALYSIS OF BEAM SECTIONS AT TRANSFER AND SERVICE LOADS.

4. **STEEL STRUCTURES:** ANALYSIS AND DESIGN OF TENSION AND COMPRESSION MEMBERS, BEAMS AND BEAM COLUMNS, COLUMN BASES. CONNECTIONS- SIMPLE AND ECCENTRIC, BEAM-COLUMN CONNECTIONS, PLATE GIRDERS AND TRUSSES.PLASTIC ANALYSIS OF BEAMS AND FRAMES.

5. **ADVANCED STRUCTURES:** ELEMENTS OF BUCKLING OF AXIALLY LOADED COLUMNS. GENERALISED HOOKE'S LAW. ELASTIC STRAIN ENERGY. ELEMENTARY TORSION PROBLEMS. PLANE STRESS, PLANE STRAIN. APPROXIMATE METHODS OF ANALYSIS FOR 2D FRAMES UNDER LATERAL LOADS. STRUCTURAL SYSTEMS FOR TALL BUILDINGS. CONCEPT OF SHEAR WALLS. YIELD LINE ANALYSIS OF R.C. SLABS, INTRODUCTION TO IS 1893. RESPONSE SPECTRUM ANALYSIS. METHODS OF PRESTRESSING & LOSSES. STRAIN MEASURING DEVICES, STRAIN ROSSETTES AND STRAIN GAGES, BEAMS ON CONTINUOUS ELASTIC FOUNDATION: BASIC CONCEPTS OF FINITE ELEMENTS METHOD, FINITE ELEMENTS OF AN ELASTIC CONTINUUM, VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS, RESPONSE SPECTRUM THEORY, BASIC CONCEPTS OF STRUCTURAL SYSTEMS, DESIGN OF FRAME (SKELETAL), SHEAR WALL (PLANER) STRUCTURES.

NOTE: EACH UNIT CARRY EQUAL MARKS