**NBKR INSTITUTE OF SCIENCE & TECHNOLOGY :: VIDYANAGAR**

*(AUTONOMOUS)*

**CIVIL ENGINEERING**

SCHEME OF INSTRUCTION AND EVALUATION

(With effect from the batch admitted in the academic year 2013-2014)

**III YEAR OF FOUR YEAR B.TECH. DEGREE COURSE – I SEMESTER**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| S.  No. | Course  Code | Course Title | Contact  Hours/  Week | | | Credits | Evaluation | | | | | | | | | | | | |
| Sessional  Test-I | | | Sessional  Test-II | | | | Total Sessional Marks (Max. 40) | Semester  End Examination | | | Max.  Total Marks | |
| **THEORY** | L | P | T |  | Duration  in Hours | | Max.  Marks | Duration  in Hours | Max.  Marks | | 0.8(Better of two sessional tests)  +  0.2(Other) | | Duration  in Hours | Max.  Marks | |  | |
| 1 | 13CE3101 | Structural Analysis - I | 3 | - | 1 | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
| 2 | 13CE3102 | R.C.C. Structural Design – I | 3 | - | 1 | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
| 3 | 13CE3103 | Steel Structural Design | 3 | - | 1 | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
| 4 | 13CE3104 | Foundation Engineering | 3 | - | 1 | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
| 5 | 13CE3105 | Transportation Engineering - II | 4 | - | - | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
| 6 | 13CE3106 | Advanced Hydraulics | 4 | - | - | 4 | 2 | | 40 | 2 | 40 | | 3 | | 60 | 100 | |
|  | | **PRACTICALS** |  |  | | | | | | | |  | | |  | | | | |
| 1 | 13CE31P1 | Soil Mechanics Laboratory | - | 3 |  | 2 | | - | - | - | - | | Day-to-day Evaluation and a test | | 3 | | 60 | | 100 |
| 2 | 13CE31P2 | Material Testing Laboratory | - | 3 |  | 2 | | - | - | - | - | | 3 | | 60 | | 100 |
|  |  | **TOTAL** | **20** | **06** | **04** | **28** | |  |  |  |  | |  | |  | | **800** |

**13CE3101 - STRUCTURAL ANALYSIS –I**

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| --- | --- | --- | --- |
| **Course category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 1 – 0 |
| **Prerequisite:** | Engineering Mechanics (II – I) & Strength of Materials (II –II). | **Sessional Evaluation :**  **Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course Outcomes** | CO1 | Determine the slope and deflection of determinate beam under various loading conditions. |
| CO2 | Be able to determine the forces in plane trusses. |
| CO3 | Be able to calculate and draw SFD and BMD for propped and fixed beams. |
| CO4 | Be able to calculate and draw SFD and BMD for continuous beams using Clapeyron’s theorem. |
| CO5 | Be able to calculate the deflections in beams and trusses using principles. |
| **Course Content** | **UNIT – I**  **DEFLECTIONS**: Relationship between curvature, slope and deflection (Differential equation for the elastic line of a beam) Slope and deflection of cantilevers and simply supported beams by integration method, moment area method and conjugate beam method for point loads, uniformly distributed loads.  **UNIT – II**  **STATICALLY DETERMINATE PIN – JOINTED PLANE FRAMES**: Computation of forces in simple and compound trusses using method of joints and method of sections – Tension coefficient method.    **UNIT – III**  **STATICALLY INDETERMINATE BEAMS:**  **(i) Propped Cantilever Beams:** Analysis of propped cantilevers for point loads uniformly distributed loads and couple – Shear force and bending moment diagrams.  **(ii) Fixed Beams**: Analysis of fixed beams with UDL, point loads, uniformly varying load, couple shear force and bending moment diagrams– Effect of sinking of supports.  **UNIT – IV**  **CONTINUOUS BEAMS**:- Introduction –Clapeyron’s theorem of three moments – Analysis of continuous beams with constant moment of inertia with one or both ends fixed – continuous beam with overhang – continuous beam with different moment of inertia for different spans – Effect of sinking of supports – shear force and bending moment diagrams.    **UNIT – V**  **ENERGY THEOREMS**: Strain energy due to axial load, bending moment and shear force – Maxwell’s, Betti’s theorems – Castigliano’s first theorem and unit load method – Deflection of simple beams and pin -jointed trusses. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**  1. Strength of Materials by R.K.Rajput.  2. Strength of Materials by R.K. Bansal.  3. Structural Analysis Vol. I & II by S. S. Bhavikatti.  **REFERENCE BOOKS**:  1. Theory of Structures – Vol.I by S.P. Gupta, G.S. Pandit & R. Gupta.  2. Comprehensive structural Analysis Vols. I& II by R. Vaidanathan & P. Perumal.  3. Analysis of Structures Vol. I & II by V.N. Vazirani & M.N. Ratwani. | |