**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. | CourseCode | Course Title | ContactHours/Week | Credits | Evaluation |
| SessionalTest-I | SessionalTest-II | Total Sessional Marks (Max. 40) | SemesterEnd Examination | Max.Total Marks |
| **THEORY** | L | P | T |  | Durationin Hours | Max.Marks | Durationin Hours | Max.Marks | 0.8(Better of two sessional tests)+0.2(Other) | Durationin 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**

|  |  |  |  |
| --- | --- | --- | --- |
| **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:** | 4060100 |

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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. |