**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** |

**13CE3104 - FOUNDATION ENGINEERING**

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| **Course category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 1 - 0 |
| **Prerequisite:** | **Soil Mechanics** | **Sessional Evaluation :**  **Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course Outcomes** | CO1 | Be able to analyse finite and infinite slopes |
| CO2 | Be able to calculate earth pressure in various soils under different types of loadings and able to analyse stability of retaining walls. |
| CO3 | Be able to calculate bearing capacity of shallow foundations |
| CO4 | Be able to design pile foundation and able to understand the deign characteristics of well foundation |
| CO5 | Understand the various methods of site exploration and be able to write investigation reports. |
| **Course Content** | **UNIT – I**  **STABILITY OF SLOPES:** Stability analysis of infinite slopes – Stability analysis of finite slopes – Swedish circle method – Friction circle method – Tailor’s stability number and use of charts – Improving stability of slopes.  **UNIT – II**  **EARTH PRESSURES:** Earth pressure theories of lateral earth pressure – Active and passive earth pressures in cohesionless and cohesive soils (with and without surcharge) – Rankine’s and Coulumb’s earth pressure theories – Graphical methods due to Rebhann and Culmann.  **EARTH RETAINING STRUCTURES:** Types of Retaining Structures – Stability Consideration of Gravity and Cantilever Retaining Walls – Drainage in retaining walls – Joints in retaining walls.  **UNIT – III**  **BEARING CAPACITY OF SHALLOW FOUNDATIONS :** Types of foundations – Depth of foundation – Terzaghi’s bearing capacity equation – Bearing capacity of square, circular, rectangular and continuous footings – Meyerhof’s theory – Skempton’s method – Brinch Hansen’s method – Effect of ground water table on bearing capacity – Bearing capacity from building codes – Tolerable settlements – Settlement analysis.  **UNIT – IV**  **PILE FOUNDATIONS:** Classification of piles – Pile driving – Load carrying capacity of piles – Dynamic formulae – Static formulae – pile load tests – Insitu penetration Tests – Group action of piles – Negative skin friction.  **WELL FOUNDATIONS:** Types – Different shapes of wells – Components of wells – functions and Design Criteria – Sinking of wells – Tilts and shifts.  **UNIT – V**  **SITE INVESTIGATIONS AND SUB-SOIL EXPLORATION:** Site reconnaissance – Depth of exploration – Lateral extent of exploration – Test pits – Auger borings – Wash borings – Soil sampling – Split – spoon sampler – Penetration tests – Geophysical methods – Seismic refraction and electrical resistivity methods – Sub soil investigation reports. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Soil Mechanics and Foundation Engineering by K.R.Arora. 2. Geotechnical Engineering by C. Venkatramaiah. 3. Soil Mechanics and foundation Engineering by P.N. Modi 4. Soil Mechanics & Foundation Engineeering by B.C.Punmia   **REFERENCE BOOKS:**   1. Analysis and design of foundations and retaining structures by Shamsher Prakash, Gopal Ranjan & Swamisaran. 2. Soil Mechanics & Foundation Engg. by V.N.S.Murthy. 3. Foundation Engineering by Teng 4. Foundation Engineeing by P.C Varghese. | |