**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** |

**13CE3106 – ADVANCED HYDRAULICS**

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

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| **Course Outcomes** | CO1 | Be able to analyze the flow characteristics in channels. |
| CO2 | Be able to design channels for uniform flow. |
| CO3 | Be able to compute specific energy and critical depth. |
| CO4 | Be able to analyze GVF and make GVF computations. |
| CO5 | Be able to analyze RVF and make RVF computations. |
| **Course Content** | **UNIT – I**  **INTRODUCTION TO CHANNEL FLOW :** Differences between pipe flow and channel flow – classification of flows – Geometric elements of channel section – velocity and pressure distributions – Velocity distribution coefficients – Parallel and curvilinear flows – Pressure correction coefficient.  **UNIT – II**  **UNIFORM FLOW:** Uniform flow – Chezy and Manning formulate – Hydraulically efficient channel sections (rectangular, triangular, trapezoidal and circular sections) – Uniform flow computations.  **UNIT – III**  **SPECIFIC ENERGY AND CRITICAL DEPTH:** Specific energy and critical depth – Critical flow computations – Applications – Transitions.  **UNIT – IV**  **GRADUALLY VARIED FLOW :** Dynamic equation of gradually varied flow – classification of flow profiles – Features of flow profiles – Control sections – Analysis of flow profiles – Gradually varied flow computations – Direct step method.  **UNIT – V**  **RAPIDLY VARIED FLOW:** Hydraulic jump – Momentum equation – Characteristics of jump in a horizontal rectangular channel – Rapidly varied unsteady flow – Surges in rectangular channels. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Open Channel Hydraulics by Ven Te Chow. 2. Flow in Open Channels by Subramanya K.   **3.** Open channel flow by Madan Mohan Das.  **REFERENCE BOOKS:**   1. Flow through Open Channels by K.G.Rangaraju. 2. Hydrology by H.M. Raghunath. 3. Hand Book of Applied hydrology by Ven Te Chow | |