**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)

**II YEAR OF FOUR YEAR B.TECH. DEGREE COURSE – II SEMESTER**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.  No. | | Course  Code | Course Title | Contact Hours/  Week | | | Cred-its | 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 | | 13CE2201 | Strength of materials | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 2 | | 13CE2202 | Fluid Mechanics - II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 3 | | 13CE2203 | Soil Mechanics | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 4 | | 13CE2204 | Transportation Engineering - I | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 5 | | 13CE2205 | Building Planning & Drawing | 1 | 3 | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 6 | | 13CE2206 | Surveying - II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
|  | | | **PRACTICALS** |  |  | | | | | | | |  |  | | | |
| 1 | 13CE22P1 | | Surveying Laboratory - II | - | 3 | - | 2 | - | - | | - | - | Day-to-day Evaluation and a test | 3 | 60 | | 100 |
| 2 | 13CE22P2 | | Fluid Mechanics & Hydraulic Machinery Laboratory | - | 3 | - | 2 | - | - | | - | - | 3 | 60 | | 100 |
|  |  | | **TOTAL** | **17** | **09** | **04** | **28** |  |  | |  |  |  |  | | **800** |

**Note:-** *Survey camp for a duration of 10 days to be conducted before the last day of instruction for II B.Tech, II – Sem. This shall be evaluated as part of Survey Laboratory –II.*

**13CE2202 - FLUID MECHANICS – II**

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

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| --- | --- | --- |
| **Course Outcomes** | CO1 | Understand the concepts of laminar flow through pipes. Be able to determine velocity and shear profiles. |
| CO2 | Understand the concepts of turbulent flow through pipes. Be able to design pipe networks. |
| CO3 | Apply the boundary layer theory in analysis of flow through pipes. |
| CO4 | Be able to determine the characteristic of turbines. |
| CO5 | Be able to determine the characteristics of pumps. |
| **Course Content** | **UNIT – I**  **FLOW THROUGH PIPES – VISCOUS FLOW**: Relation between shear and pressure gradients – Laminar flow through circular pipes – Velocity distribution in laminar flow – Hagen – Poiseuille equation – Flow between parallel plates.  **UNIT – II**  **FLOW THROUGH PIPES – TURBULENT FLOW:** Velocity distribution in turbulent flow – Resistance of smooth and roughned pipes – Commercial pipes – Siphons – Pipes in series and parallel, branching pipes – pipe networks – Hardy Cross method.  **UNIT – III**  **BOUNDARY LAYER:** Description – Boundary Layer thickness – Formation of boundary layer over a flat plate- Separation of boundary layer – Boundary layer control.  **FLOW AROUND SUBMERGED OBJECTS:** Drag and lift – types of Drag – Drag on flat plate, Cylinders and airfoils, lift on airfoils, Magnus effect.  **UNIT – IV**  **HYDRAULIC TURBINES :** Classification – Work done and efficiency of Pelton Wheel, Francis and Kaplan Turbines – Draft tube – Performance – Unit quantities – Specific speed – Cavitation.  **UNIT – V**  **CENTRIFUGAL PUMPS:** Classification – Work done and efficiency – Multistage pumps – Specific speed – Characteristics | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Fluid Mechanics and Hydraulic Machines by Rajput R. K. 2. Hydraulics and Fluid Mechanics by P.N.Modi and S.M.Seth.   **REFERENCE BOOKS:**   1. A text book of Fluid Mechanics & Hydraulic Machines by R.K.Bansal. 2. Fluid Mechanics and Fluid Machines – S.K. Som & G.Biswas. | |