**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 – I 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 | 13SH2102 | Computational Techniques, Statistics and Complex Analysis | 3 | - | 1 | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
| 2 | 13CE2101 | Engineering Mechanics | 3 | - | 1 | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
| 3 | 13CE2102 | Fluid Mechanics - I | 3 | - | 1 | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
| 4 | 13CE2103 | Building Technology | 4 | - | - | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
| 5 | 13CE2104 | Surveying – 1 | 3 | - | 1 | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
| 6 | 13CE2105 | Engineering Geology | 4 | - | - | | 4 | | 2 | | 40 | | 2 | | 40 | | 3 | 60 | | 100 | |
|  | | **PRaCTICALS** |  |  | | | | | | | | | | | | |  |  | | | | |
| 7 | 13CE21P1 | Surveying Laboratory – I | - | 3 | | - | | 2 | | - | | - | | - | | - | Day-to-day Evaluation and a test | 3 | | 60 | | 100 |
| 8 | 13CE21P2 | Engineering Geology Laboratory | - | 3 | | - | | 2 | | - | | - | | - | | - | 3 | | 60 | | 100 |
|  |  | **TOTAL** | **20** | **06** | | **04** | | **28** | | **-** | | **-** | | **-** | | **-** | **-** | | **-** | | **800** |

**13CE2102 - FLUID MECHANICS - I**

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

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| --- | --- | --- |
| **Course Outcomes** | CO1 | To be able to solve problems involving fluid properties and shear forces resulting from Newtonian fluids. |
| CO2 | To be able to calculate the magnitude and location of hydrostatic forces on flat plates and curved surfaces. Also be able to determine Metra-centric hieght of the floating bodies |
| CO3 | Be able to describe and interpret the behavior and performance of fluid in motion. |
| CO4 | To be able to assess the validity of Bernoulli’s Equation for various fluid systems. To be able to determine the pertinent fluid properties from measurements taken by a pitot tube and to be able to determine the discharge using flow measuring devices. |
| CO5 | Be familiar with dimensional analysis of fluid problems. Be able to apply similitude and modelling principles and techniques to solve problems in hydraulics |
| **Course Content** | **UNIT – I**  **FLUID PROPERTIES** : Definition of a fluid – Density, Specific weight, Specific volume, Specific gravity – Viscosity – Bulk modulus of elasticity – Vapour pressure – Surface tension and capillarity – Continuum.  **UNIT – II**  **FLUID STATICS :** Pressure at a point – Absolute and guage pressures – Pascal’s and Hydrostatic laws – Pressure measurement – Manometers and mechanical gauges – Hydrostatic thrust on plane and curved surfaces – Buoyancy and flotation –Metacentric height.  **UNIT – III**  **FLUID FLOW CONCEPTS**: Flow characteristics – Velocity – acceleration – Types of flow – Streamlines, path lines, streak lines – stream function, velocity potential, flownet – circulation and Vorticity.  **UNIT – IV**  **FUNDAMENTAL EQUATIONS:** Continuity equation – Euler’s equation of motion along a streamline – Bernoulli’s equation –Linear momentum equation – Forces on a bend – Fixed and moving vanes – Moment of momentum equation – Torque on sprinklers.  **UNIT – V**  **FLOW MEASUREMENT**: Velocity measurement – Pitot tube – Pitot Static tube – Discharge measurement – Orifices and Mouth pieces – Venturimeter, Nozzlemeter, Orificemeter, Notches and Weirs.  **DIMENSIONAL ANALYSIS AND SIMILITUDE:** Dimensional homogeneity – Methods of dimensional analysis – Model investigations – Similitude – Dimensionless numbers – Model laws – Undistorted and distorted models – Scale effects. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Hydraulics and Fluid Mechanics by P.N.Modi and S.M.Seth. 2. Fluid Mechanics & Hydraulic Machines by A K Jain. 3. Fluid Mechanics & Hydraulic Machines by R.K Bansal.   **REFERENCE BOOKS:**   1. Fluid Mechanics by V.L. Streeter and E. Benzamine Wylie. 2. A Text Book of Fluid Mechanics by Rajput R.K. 3. Engineering Fluid Mechanics by K.L.Kumar. | |