**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**

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| --- | --- | --- | --- | --- | --- |
| S.No. | CourseCode | Course Title | Contact Hours/Week | Cred-its | 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 | 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** |

**13CE2101 – ENGINEERING MECHANICS**

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| --- | --- | --- | --- |
| **Course category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 1 - 0 |
| **Prerequisite:** | Engineering physics, Engineering Mathematics | **Sessional Evaluation :****Univ.Exam Evaluation:****Total Marks:** | 4060100 |

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| --- | --- | --- |
| **Course Outcomes** | CO1 | Determine the components of force in rectangular or non-rectangular coordinates, the resultant force and moment for a given system of forces |
| CO2 | Determine the support reactions on structures and analyze systems that include frictional forces. |
| CO3 | Locate the centroid of an area, calculate the second moment and principal second moment of an area |
| CO4 | Calculate the motion characteristics of a body subjected to a given force system |
| CO5 | Determine the deformation of a shaft (simple, tapered and compound) and understand the relationship between different material constants. Determine temperature stresses |
| **Course Content** | **UNIT-I****STATICS**: Introduction - units and dimensions - Law of mechanics, vectors, vectorial representation of forces and moments, vector operations. Coplanar and concurrent forces, resolution and composition of forces - Equilibrium of a particle - Equivalent systems of forces - Principle of transmissibility, single equivalent force, free body diagram- Types of supports and their reactions, equilibrium of rigid bodies in two dimensions.**UNIT – II****PROPERTIES OF SURFACES AND SOLIDS**: Determination of areas and volumes - First moment of area and the centroid - second and product moments of plane area - Parallel axis theorems and perpendicular axis theorems - Polar moment of inertia - Principal moments of inertia of plane areas - Principal axes of inertia.**UNIT – III****FRICTION :** Types of friction - limiting friction - Laws of friction - Static and dynamic friction - motion of bodies –Bolt drivers, open crossed and compound - length of belt, tension, tight side and slack side initial and centrifugal - Power transmitted and conditions for maximum power.**UNIT – IV****DYNAMICS**: Displacement, velocity and acceleration, their relationship - Relative motion - Curvilinear motion - Newton’s law of motion - Impact of elastic bodies - Moment of Momentum Equations - Work energy equation, D’Alemberts Principle and its uses, Impulse and Momentum. **UNIT – V**Concept of Stress and Strain - Elasticity and Plasticity - Hooke’s law - Stress- Strain diagram - tapered bars, Compound bars - Poison’s ratio - Volumetric strain - relation between elastic constants - temperature stresses - factor of safety - ductile and brittle materials under compression- endurance limit. |
| **Text Books and reference Books:** | **TEXT BOOKS:**1. Engineering Mechanics by Timoshenko, Young and Baskar Rao.
2. Engineering Mechanics by Shames & Rao
3. Engineering Mechanics by Bhattacharya.

**REFERENCE BOOKS**1. Engineering Mechanics by F L Singher.
2. Engineering Mechanics by J L Merium.
3. Engineering Mechanics And statistics by PB Beer & E R Jhostan.
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