**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.*

**13CE 2204 TRANSPORTATION ENGINEERING – I**

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| --- | --- | --- | --- |
| **Course category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 1 - 0 |
| **Prerequisite:** | None | **Sessional Evaluation :**  **Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| --- | --- | --- |
| **Course Outcomes** | CO1 | Able to demonstrate the types and importance of transportation and fundamentals of traffic engineering. |
| CO2 | Able to carry out surveys involved in planning and highway alignment and to select the best alignment out of various alternatives. |
| CO3 | Able to design cross section elements of road, sight distance, horizontal alignment and vertical curves etc. |
| CO4 | Able to determine the characteristics of pavement materials. |
| CO5 | Able to design suitable pavement as per IRC and calculate the quantity as well as quality of materials required. |
| **Course Content** | **Unit - I**  **HIGHWAY ENGINEERING:** Importance of transportation, modes of transportation, characteristics of road transport, classification of roads, Highway alignment, basic requirements, controlling factors, master plan and its phasing.  **Unit - II**  **GEOMETRIC DESIGN:** Important elements – cross section elements – pavement surface characteristics, camber, width of pavement, kerbs, road margins, formation width, right of way, sight distance – factors affecting sight distance – different situations Problems included . Horizontal alignment – Design speed, super elevation, extra widening, gradient and types – vertical curves.  **Unit - III**  **HIGHWAY MATERIALS**: Aggregates and Bitumen – desirable properties, tests and specifications, Desirable properties of bitumen – aggregate mixes  **Unit - IV**  **PAVEMENT DESIGN**: Types, components and their functions, Design factors, Design of flexible pavements – Group index method and IRC method based on CBR value.  **DESIGN OF RIGID PAVEMENTS -** Wester gaard’s equations, IRC recommendations for design of concrete pavement slab, Types of joints, joint filler materials, joint sealer materials  **Unit - V**  **CONSTRUCTION AND MAINTENANCE OF ROADS**: Construction and maintenance of WBM, Bituminous and concrete roads.  **HIGHWAY DRAINAGE:** Importance, surface and sub-surface drainage methods | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Highway Engineering by Khanna, S.K. and Justo C.E.G. 2. Principles and Practice of Highway Engineering by Dr. L.R.Kadiyali.   **REFERENCE BOOKS:**   * 1. Guidelines for the Design of Flexible Pavements, IRC:37-1984.   2. Guidelines for the Design of Rigid Pavements for Highways, IRC:58-1988.   3. Principles, Practice and Design of Highway Engineering by S.K. Sharma.   4. A course in Highway Engineering by S.P. Bindra.   5. Transportation Engineering, Vol. I by Vazirani and Chandola. | |