**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 – II SEMESTER**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | 13CE3201 | R.C.C. Structural Design - II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 2 | 13CE3202 | Hydrology | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 3 | 13CE3203 | Structural Analysis -II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 4 | 13CE3204 | Concrete Technology | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 5 | 13CE3205 | Environmental Engineering - I | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 6 | 13CE32EX | Elective –I | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
|  | | **PRACTICALS** |  |  | | | | | | | |  |  | | | |
| 1 | 13SH32P1 | Advanced Communication Skills Laboratory | - | 3 | - | 2 | - | - | | - | - | Day-to-day Evaluation and a test | 3 | 60 | | 100 |
| 2 | 13CE32P1 | Highway Materials Laboratory | - | 3 | - | 2 | - | - | | - | - | 3 | 60 | | 100 |
|  |  | **TOTAL** | **22** | **06** | **02** | **28** |  |  | |  |  |  |  | | **800** |

**Elective I:**

13CE32E1 Industrial Steel Structural Design

13CE32E2 Advanced Foundation Engineering

13CE32E3 Transportation Planning

13CE32E4 Industrial Waste and Waste Water Management

13CE32E5 Ground Water Hydrology

**13CE3205 - ENVIRONMENTAL ENGINEERING – I**

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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 | Identify the sources of water and intake works for collection. Be able to forecast and calculate water demand. |
| CO2 | Be able to determine the water quality and understand the conventional methods of water treatment. |
| CO3 | Understand the concepts of filtration and disinfection. |
| CO4 | Apply the advanced water treatment methods. |
| CO5 | Understand the various methods of conveyance and distribution of water. Be able to design pipe-networks by hardy-cross method. Understand various joints, valves and house service connections. |
| **Course Content** | **UNIT – I**  **SOURCES, DEMAND AND COLLECTION OF WATER:** Sources of water-Source selection Water demand-Types-Factors affecting water demand-Fluctuations in water demand-Design period-Population forecasting methods and their suitability-Intake works for collection of water.  **UNIT – II**  **WATER QUALITY:** Need for protected water supply-Water quality- Characterization-Water quality standards-Water-borne diseases  **CONVENTIONAL TREATMENT OF WATER:** General outline of conventional water treatment units and their functions-Theory of aeration-Aeration methods-Principles and design of sedimentation-coagulation, flocculation and clarification  **UNIT – III**  **FILTRATION AND DISINFECTION:** Theory of filtration-Types of filters- Working and design of slow and rapid sand filters-Operational troubles in filters-Disinfection-Types of disinfectants-Theory of chlorination-Break point chlorination.  **UNIT – IV**  **ADVANCED TREATMENT METHODS:** Membrane process- Removal of salinity-Adsorption technique-Removal of arsenic-Ion exchange process-Removal of hardness-Chemical oxidation and precipitation-Removal of Iron &, manganese, fluorides.  **UNIT – V**  **CONVEYANCE SYSTEM:** Intake structures-Systems of conveyance of water-Pipe materials Hydraulics of flow in pipes  **WATER DISTRIBUTION:** Requirements of water distribution-Components-Service reservoirs Layout of distribution networks-Design of pipe networks-Hardy cross and equivalent pipe method-Pipe joints-Valves-House service connections. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Water Supply Engineering by S.K. Garg. 2. Water Supply Engineering by B.C.Punmia.   **REFERENCE BOOKS:**   1. Water Treatment Principles and Design by James M. Montgomery. 2. Water and waste water Technology by E.W. Steel. 3. Environmental Engineering by H.S. Peavy et al., | |