**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. | 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** |

**13SH2102-COMPUTATIONAL TECHNIQUES, STATISTICS AND COMPLEX ANALYSIS**

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

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| **Course Outcomes** | CO1 | Students will be able to understand the applications to the solution of partial differential equations, one dimensional wave equation, one dimensional heat equation and two dimensional Laplace equation to solve initial and boundary value problems in a physical situations satisfying the conditions. |
| CO2 | We are studying series solutions of differential equation because we want to study linear differential variable coefficients, Bessel functions and Legendre functions are occurring spherical symmetry and cylindrical symmetry. |
| CO3 | We are studying complex analytical functions because checking for analyticity is done by Cauchy Riemann equations, why these equations are important because their relation to the Laplace equation. Elementary complex functions are studying because their knowledge is useful for practical work. |
| CO4 | The complex integration is studying by us to evaluate certain integrals of real variable which are not solved by knowledge of integral calculus. Explaining about Cauchy’s integral theorem and Cauchy’s integral formulas useful because it tells the existence of higher derivatives of an analytic function The topic Taylor’s and Laurent’s series are useful because we can write every analytic function can be written as power series. |
| CO5 | Understanding effectively the Z Transformations of standard functions and their properties. Understanding effectively, convolution theorem and also the applications of Z transforms to difference equations. |
| **Course Content** | **UNIT – I**  **ROOTS OF NON-LINEAR EQUATIONS:** Bisection – False position – Iteration – Newton-Raphson Methods.  **INTERPOLATION:** Newton’s forward and backward interpolation formula and Lagrange’s interpolation.  **UNIT – II**  **SOLUTION OF SIMULTANEOUS LINEAR AND NON-LINEAR ALGEBRAIC EQUATIONS:** Iteration methods – Gauss Jordon – Gauss Elimination with Pivotal condensation –Triangular Factorization method- Gauss-Seidal method – Newton- Raphson methods.    **UNIT – III**  **NUMERICAL DIFFERENTIATION AND INTEGRATION:** First and Second Derivatives at given points by Newton’s formula – Maxima and Minima of a tabulated function. Trapezoidal rule, Simpson’s 1/3 rule and Simpson’s 3/8 rule.  **UNIT – IV**  **PROBABILITY AND STATISTICS:** Introduction – Random experiments - Random variables – Discrete and Continuous distributions – Binomial, Poisson and Normal distributions  **UNIT – V**  **COMPLEX ANALYSIS:** Analytical functions – Cauchy - Riemann equation – Construction of Analytic function. Complex Integration – Cauchy’s theorem – Cauchy’s integral formula –Evaluation of integrals – Taylor’s theorem and Laurent’s theorem (without proof). | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Higher Engineering Mathematics by B.S.Grewal, Kanna Publishers. 2. Higher Engineering Mathematics by H K Das et al.,   **REFERENCE BOOKS:**   1. Introductory methods of Numerical Analysis by S. S. Sastry. 2. Numerical Methods by E. Balagurusamy. 3. Engineering Mathematics-III by TKV Iyengar, S.Chand.   Statistics – Schuam’s Series. | |