**20SH1203-ENGINEERING MATHEMATICS –II**

(Common to all)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Category:** | | | Basic Sciences | **Credits:** | 3 |
| **Course Type:** | | | Theory | **Lecture-Tutorial-Practical:** | 2-2-0 |
| **Pre – requisite:** | | | Intermediate Mathematics | **Sessional Evaluation:**  **External Evaluation:**  **Total Marks:** | 40  60  100 |
| **Course**  **Objectives** | To make the student learn about | | | | |
| 1. The concepts of Double integrals, Areas and Volumes 2. The basic concepts of Triple integrals and its volume, Beta and Gamma functions. 3. The Gradient, Divergence and Curl operators, Solenoidal and Irrotational vectors. 4. The basic concepts of Vector Integration. 5. The determination of Fourier coefficients, Fourier series, Even and Odd Functions and Change of intervals. 6. The concepts of Fourier Transforms. | | | | |
| **Course Outcomes** | After completing the course the student will be able to | | | | |
| **CO1** | Attains skills in analyzing the Double integrals also its Areas and Volumes. | | | |
| **CO2** | Understand effectively in analyzing the Triple integrals, Beta and Gamma functions | | | |
| **CO3** | Acquire knowledge in analyzing the Curl, Divergence and Gradient operators, Solenoidal and Irrotational vectors with their applications. | | | |
| **CO4** | Attains skills in analyzing the applications ofGreen’s, Stoke’s and Gauss-divergence theorems. | | | |
| **CO5** | Develop analytical skills in solving the problems involving Fourier Series. | | | |
| **CO6** | Understand effectively Fourier Sine and Cosine integral, Fourier Transforms, Fourier Sine and Cosine transforms. | | | |
| **Course Content** | **UNIT - I**  **Double integrals:** Double integrals - Change of order of integration - Change to polar coordinates - Area and Volumes by double integration.  **UNIT - II**  **Tripple integrals and Special functions:** Evaluation of triple integrals, Volume by triple integral. Beta and Gamma functions and their properties, Relation between Beta and Gamma functions.  **UNIT - III**  **Vector Differentiation:** Scalar and vector point function, Vector operator Del, Del applied to scalar point function, Gradient, Divergence, Curl, Solenoidal and Irrotational vectors.  **UNIT - IV**  **Vector Integration:** Line integral-circulation-workdone, Surface integrals – flux, Green’s theorem in the plain (Without proof), Stoke’s theorem (Without proof), Volume integral, Gauss-divergence theorem (without proof).  **UNIT-V**  **Fourier Series:** Determination of Fourier coefficients - Fourier series - Even and Odd functions - Change of intervals (0,2l).  **UNIT-VI**  **Fourier Transforms:** Fourier Integral Theorem (Without proof)-Fourier Sine and Cosine integral - Fourier integral in complex form - Fourier Transforms - Fourier Sine and Cosine transforms. | | | | |
| **Textbooks**  **& Reference Books** | **TEXT BOOKS:**   1. Higher Engineering Mathematics - B.S.Grewal, Khanna Publishers, New Delhi. 2. Engineering Mathematics - B.V. Ramana, Tata McGraw-Hill Education Pvt. Ltd, New Delhi. | | | | |
| **REFERENCE BOOKS:**  1.Higher Engineering Mathematics - H.K. Dass, Er. RajnishVerma, S.Chand Publication, New Delhi.  2.Advanced Engineering Mathematics - N.P. Bali & M. Goyal, Lakshmi Publishers, New Delhi.  3.Advanced Engineering Mathematics - Erwin Kreyszig, Wiley, India | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Contribution of Course Outcomes towards achievement of Program Outcomes (3-High, 2-Medium, 1-Low) | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 3 | - | - |
| CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - |
| CO3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 2 | 3 | - | - |
| CO4 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - |
| CO5 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | - | - |
| CO6 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | - | - |