**20SH1202 - ENGINEERING MATHEMATICS –II**

(Common to all branches)

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| **Course Category:** | Basic Science | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture-Tutorial-Practical:** | 3-0-0 |
| **Pre – requisite:** | Intermediate Mathematics | **Sessional Evaluation:**  **External Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course**  **Objectives** | 1. The concepts of Double and triple integrals, Areas and Volumes 2. The Gradient, Divergence and Curl operators, Solenoidal and Irrotational vectors. 3. The basic concepts of Vector Integration. 4. The determination of Fourier coefficients, Fourier series, Even and Odd Functions and Change of intervals. 5. The concepts of Fourier Transforms. 6. Concepts of z-transform and its inverse trans form. | |
| **Course Outcomes** | CO1 | Attains skills in analyzing the Double integrals and triple integrals also its Areas and Volumes. |
| CO2 | Acquire knowledge in analyzing the Curl, Divergence and Gradient operators, Solenoidal and Irrotational vectors with their applications. |
| CO3 | Attains skills in analyzing the applications of Green’s, Stokes’s and Gauss-divergence theorems. |
| CO4 | Develop analytical skills in solving the problems involving Fourier Series. |
| CO5 | Understand effectively Fourier Sine and Cosine integral, Fourier Transforms, Fourier Sine and Cosine transforms. |
| CO6 | Learn the concepts of Z- transform and its inverse transform. Student able to apply z-transforms to solve difference equations. |
| **Course Content** | **UNIT - I**  **Multiple integral**: –Evaluation of double integrals – Change the order of integration – Change of Variables – Area by double integration – triple integrals  ( only in Cartesian form ) – Volume by triple integral.  **UNIT - II**  **Vector Differentiation:** Scalar and vector point function – Del operator: Gradient, Divergence, Curl – Solenoidal and Irrotational vectors – Scalar potential.  **UNIT - III**  **Vector Integration:** Line integral, circulation, work done – Surface integrals, flux – Green’s theorem in the plain (Without proof) – Stokes’s theorem (Without proof) – Volume integral, Gauss-divergence theorem (without proof).  **UNIT - IV**  **Fourier Series: Fourier Series:** Determination of Fourier coefficients for Fourier series of f(x) in (0,2) and (-,) - Fourier series for an Even and Odd functions - Change of intervals.  **UNIT-V**  **Fourier Transforms:** Fourier Integral Theorem (Without proof)-Fourier Sine and Cosine integral - Fourier Transforms and its inverse transform - Fourier Sine and Cosine transforms.  **UNIT-VI**  **Z-Transforms:** Z**-**Transform of some standard functions, Properties of Z**-**Transforms, Shifting Properties, Initial value theorem and final value theorem, Inverse Z-Transform, Convolution theorem, Inversion by partial fractions and Applications to difference equations. | |
| :  **Text Books & Reference Books** | **TEXTBOOKS:**   1. B. S. Grewal, *“Higher Engineering Mathematics”*, Khanna Publishers, New Delhi. 44th edition, 1965. 2. B.V. Ramana, *“Engineering Mathematics”*, Tata McGraw-Hill Education Pvt. Ltd, New Delhi, 1st editon,2017.   **REFERENCES:**   1. H.K. Dass, Er. Rajnish Verma, *“Higher Engineering Mathematics”*, S. Chand Publications, New Delhi, 2014. 2. N.P. Bali & M. Goyal, *“Advanced Engineering Mathematics*”, Lakshmi Publishers, New Delhi. 1st edition, 2015. 3. Erwin Kreyszig, *“Advanced Engineering Mathematics*” Wiley publications, India. 10th edition, 2010. | |