**17SH2101 - ENGINEERING MATHEMATICS -II**

**(Common to all Branches)**

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| **Course Category** | Basic Science  | **Credits** | 3 |
| **Course Type** | Theory | **Lecture-Tutorial-Practical** | 2-2-0 |
| **Prerequisite** | Intermediate Mathematics | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course****Objectives** | 1. The concept of First shifting theorem, change of scale property, Laplace transformation of multiple by t and division by t and transformation of derivatives and integrals.
2. The application of solutions of ordinary differential equations.
3. The determination of Fourier coefficients, Fourier series, even and odd functions and change of intervals.
4. The concept of Fourier transforms.
5. The properties of Z**-**Transforms, shifting properties, initial value and final value theorems.
6. The applications of difference equations and to develop the basic mathematical knowledge and computational skills of the students in the areas of applied mathematics.
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| **Course Outcomes** | CO1 | Acquire basic knowledge in Laplace transforms and their applications. |
| CO2 | Develop analytical skills in solving the ordinary differential equations by using the Laplace transform technique. |
| CO3 | Develop analytical skills in solving the problems involving Fourier series. |
| CO4 | Understand effectively Fourier sine and cosine integral, Fourier transforms, Fourier sine and cosine transforms. |
| CO5 | Attains skills in analyzing the Z**-**Transforms and their applications. |
| CO6 | Understand effectively Inverse Z - Transforms and applications to difference equations. |
| **Course****Content** | **UNIT – I****LAPLACE TRANSFORMATION:** Laplace transformations of standard functions – First shifting theorem – Change of scale property – Laplace transformation of multiple by t and division by t – Transformation ofderivatives and integrals. **UNIT – II****INVERSE LAPLACE TRANSFORMATION:** Inverse transforms – Method of partial fractions – Shifting property – Inverse Laplace transform of a multiple by s and division by s – Inverse Laplace transform of derivatives and integrals – Convolution theorem – Application to solutions of ordinary differential equations.**UNIT – III****FOURIER SERIES:** Determination of Fourier coefficients – Fourier series –Even and odd functions – Change of intervals (0,2l).**UNIT – IV****FOURIER TRANSFORMS:** Fourier Integral Theorem (Without proof) –Fourier sine and cosine integrals – Fourier integral in complex form – Fourier Transforms – Fourier sine and cosine transforms.**UNIT – V****Z-TRANSFORMS:** Z–Transform of some standard functions – Properties of Z**-**Transforms – Shifting properties– Initial value theorem and final value theorem. **UNIT – VI****INVERSE Z**- **TRANSFORM AND DIFFERENCE EQUATIONS:** Inverse Z-Transform – Convolution theorem - Inversion by partial fractions – Applications to difference equations. |
| **Textbooks****& Reference books** | **TEXTBOOKS:**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.
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