

**15ABS07-MATHEMATICS – II**

(Common for all Branches)

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**Objectives:** Our emphasis will be more on conceptual understanding and applications of Fourier series, Laplace transforms, Fourier transforms, Z transforms and solutions of partial differential equations.

**UNIT – I**

Laplace transform of standard functions – Inverse transform – First shifting Theorem, Transforms of derivatives and integrals – Unit step function – Second shifting theorem – Dirac's delta function – Convolution theorem – Laplace transform of Periodic function.

Differentiation and integration of Laplace transforms – Applications of Laplace transform to ordinary differential equations of first and second order.

**UNIT – II**

Fourier Series: Determination of Fourier coefficients – Fourier series – Even and odd functions – Fourier series in an arbitrary interval – Even and odd periodic continuation – Half-range Fourier sine and cosine expansions- Parseval's formula- Complex form of Fourier series.

**UNIT – III**

Fourier integral theorem (only statement) – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – Properties – Inverse transforms – Finite Fourier transforms.

**UNIT – IV**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace's equation under initial and boundary conditions.

**UNIT – V**

z-transform – Inverse z-transform – Properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equations by z-transforms.

**Text Books:**

1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.
2. Higher Engineering Mathematics, by B.V.Ramana, Mc Graw Hill publishers.

**References:**

1. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
2. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad S. Chand publication.
3. Engineering Mathematics, Volume - II, E. Rukmangadachari, Pearson Publishers.

*msr*  
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**Outcomes:**

At the end of the course, the student will be able to attain the abilities to use mathematical knowledge to analyze, formulate and solve problems in engineering applications, using discrete and continuous transforms and partial differential equations.

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