

ADDITIONAL MATHEMATICS – I

Course code: AM31

Course Credits: 0:0:0

Semester: 03

Contact hours: 40

Unit-I

Differential Calculus-I -08 Hrs

Successive differentiation, n^{th} derivatives of some standard functions, Leibnitz theorem, Polar curves. Angle between the radius vector and the tangent, angle between curves, length of the perpendicular from pole to the tangent, pedal equations. Taylor's and Maclaurin's expansions.

Unit-II

Integral Calculus -08 Hrs

Introduction, Reduction formula, Reduction formula for $\int \sin^n x \, dx$, Reduction formula for $\int \cos^n x \, dx$, Reduction formula for $\int \sin^n x \cos^m x \, dx$, Evaluation of double and triple integrals.

Unit-III

Vector Algebra-08 Hrs

Scalar and vectors. Vector addition and subtraction. Multiplication of vectors (Dot and Cross products). Scalar and vector triple product-simple problems. Vector functions of a single variable. Derivative of a vector function, geometrical interpretation. Velocity and acceleration.

Unit -IV

Vector Differentiation-08Hrs

Scalar and vector fields, gradient of a scalar field, directional derivative, divergence of a vector field, solenoidal vector, curl of a vector, irrotational vector, Laplace's operator. Vector identities connected with gradient, divergence and curl.

Unit- V

First Order Differential Equations-08 Hrs

Solution of first order and first degree differential equations, variable separable methods, homogeneous equations, linear and Bernoulli's equations, exact differential equations.

Text Books:

1. B.S. Grewal – Higher Engineering Mathematics – Khanna Publishers – 40th edition – 2007.
2. Erwin Kreyszig – Advanced Engineering Mathematics – Wiley publication – 8th edition – 2004.

References:

1. H.K. Dass – Higher Engineering Mathematics – S Chand Publications - 1998.
2. B.V. Ramana – Engineering Mathematics – Tata McGrawHill Publishing Co. Ltd. – New Delhi – 2008.

ADDITIONAL MATHEMATICS – II

Course code: AM41

Course Credits: 0:0:0

Semester: IV

Contact hours: 40

Unit-I

Differential calculus - 08 Hrs

Partial differentiation, Euler's theorem, total differential coefficient, differentiation of composite and implicit functions, Jacobian and Properties. Taylor's theorem for function of two variables, maxima and minima for functions of two variables.

Unit-II

Vector integration – 08 Hrs

Line integrals, surface integrals and volume integrals. Green's theorem, Stokes' and Gauss divergence theorem (without proof) and problems, orthogonal curvilinear coordinates.

Unit-III

Laplace transforms - 08 Hrs

Definitions, Laplace transforms of elementary functions, derivatives and integrals, periodic function, unit step function, inverse transforms, applications of Laplace transforms to solve differential equations.

Unit-IV

Higher Order Differential Equations - 08 Hrs

Higher order linear differential equations, method of variation of parameters, Cauchy's and Legendre's homogeneous differential equations.

Unit-V

Probability - 08Hrs

Introduction. Sample space and events. Axioms of probability. Addition and multiplication theorems. Conditional probability-illustrative examples. Bayes theorem –examples.

Text Books:

1. B.S. Grewal – Higher Engineering Mathematics – Khanna Publishers – 40th edition – 2007.
2. Erwin Kreyszig – Advanced Engineering Mathematics – Wiley publication – 8th edition – 2004.

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