EC/EE/ME-101

DIFFERENTIAL EQUATIONS AND STATISTICS

B.Tech.(EC)/R-16/2016-2017

- COURSE OBJECTIVES:
 To provide knowledge on solving ordinary differential equations.
- 2. To To provide knowledge on applications of first order ordinary differential equations.
- 3. To provide knowledge on solving higher order ordinary differential equations.
- 4. Focused in partial differential equations.
- 5. To provide knowledge on curve fitting, correlation and regression lines.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

- 1. demonstrate Ordinary differential equations, Partial differential equations, Method of least squares and Correlation and regression.
- 2. apply knowledge of first order differential equations to find complementary function of higher order equations.
- 3. evaluate particular integral and solve Cauchy and Legendre's equations.
- 4. solve partial differential equations.
- 5. select the appropriate normal equations to fit a curve and regression analysis.

UNIT I

Differential Equations of First Order :

Definition - Formation of differential equation - Equations of first order and first degree : Linear equations, Bernoulli's equation.

Exact differential equations - Equations reducible to exact equations.

UNIT II

Applications of differential equations of first order : Orthogonal trajectories, Newton's law of cooling, Growthand decay problems.

Higher order Linear Differential Equations : Definitions - Operator D - Rules for finding the complementary function.

UNIT III

Inverse operator - Rules for finding Particular Integral - working procedure. Method of variation of parameters.

Equations reducible to linear equations with constant coefficients : Cauchy's and Legendre's Linear equations.

UNIT IV

Partial Differential Equations :

Formation - Equations solvable by direct integration - Linear equations of first order- Lagrange's linear equation.

Linear Homogeneous partial differential equations of higher order with constant coefficients.

UNIT V

Statistics : Method of least squares - Fitting of straight line and parabola.

Correlation, Co-efficient of correlation (direct method), Lines of regression.

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LEARNING RESOURCES:

TEXT BOOK(s):

B.S.Grewal - Higher Engineering Mathematics, Khanna publishers, 40th edition, 2007.

REFERENCE BOOK(s):

Erwin Kreyszig - Advanced Engineering Mathematics, 8th edition, New Age International (P) Ltd., 2007.

WEB RESOURCES:

http://nptel.iitm.ac.in/courses/