Devi Ahilya University, Indore, India Institute of Engineering & Technology				**BE I Year (Common to all branches) (Part Time)**			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
AMP2C1: Applied Mathematics-II	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	2	**1**	**0**	**2**	**1**	**0**	**3**
Duration of Theory Paper: 3 Hours							

Course Objectives: To introduce the mathematical concepts of Matrix Algebra, Probability, and Differential Equation for solving engineering problems that shall be used in various branches of engineering.

Prerequisite(s): Nil

COURSE OF CONTENTS

UNIT-I

Matrix Algebra: Review of Matrices; Elementary Operations on Rows and Columns; Normal Form; Linear Dependence; Rank; Application of Rank Theory in Solving System of Linear Equations; Linear Transformation; Orthogonal, Unitary and Hermitian Matrices; Characteristic Equation; Eigen- Values and Eigen-Vectors; Caley-Hamilton Theorem; Quadratic and Linear forms.

UNIT-II

First Order Ordinary Differential Equation: Exact Differential Equation; Equations Solvable for x, y and p; Clairaut's Form; Application to Simple Problems.

Higher Order Ordinary Differential Equation: Linear Differential Equations with Constant & Variable Coefficients; Method of Variation of Parameters, Simultaneous Differential Equations; Application to Simple Problems.

UNIT-III

First Order Partial Differential Equations: Formation of Partial Differential Equations; Partial Differential Equations of First Order and First Degree i.e. $Pp + Qq = R$.

Higher Order Partial Differential Equations: Linear Homogenous Partial Differential equations of n^{th} order with constant coefficients; method of Separation of variables; their Simple applications.

UNIT-IV

Probability and Statistics: Conditional Probability, Baye's Theorem; Binomial, Poisson and Normal distributions and their Mean and Variance, Methods of least squares and curve fitting, Correlation and Regression Analysis.

UNIT-V

Theory of Equations: Polynomial equations, relation between root and coefficients, symmetric functions of roots, cube roots of unity, Cardon's method for solution of cubic equations.

Fuzzy sets: Membership function, definition, Operations on Fuzzy sets, Properties of Fuzzy sets.

BOOKS RECOMMENDED:

[1] B.S.Grewal, Engineering Mathematics, 39/e, Khanna Publishers, 2006.

[2] Erwin. Kreyszig, Advanced Engineering Mathematics, 8^{th} edition, John Willy and sons Publications, 1999.

[3] Ramana B V, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006.
[4] C.Ray Wylie & Louis C. Barretle, Advanced Engineering Mathematics, Tata McGraw Hill Publishing Co. Ltd., 6/e, 2003.
[5] H.K.Das, Higher Engineering Mathematics, S.Chand New Delhi.
[6] Zafar Ahsan, Differential Equation and their Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 2004.
[7] S.C.Gupta and V.K.Kapoor, Fundamentals of Mathematical statistics, Sultan Chand & Sons., 2000.
[8] Freund John E, Mathematical Statistics, PHI, N.D., 7th Ed., 2010.
[9] G. J. Klir and Bo Yuan, Fuzzy Sets and Fuzzy Logic: Theory and Applications, PHI, New Delhi, 2005.
[10] H. J. Zimmerman, Fuzzy Set Theory and its Applications, Allied Publishers, 1996.
[11] Timothy J. Ross, Fuzzy Logic with Engineering Applications, 3rd Edition, John Wiley & Sons, Inc., 2010.