RESEARCH METHODOLOGY & EDUCATIONAL TECHNOLOGY - M16MS1

Semester: I **Core Course : I**

Instruction Hours/Week: 4 **Credit :4**

Research Methodology

Unit – I

An introduction -Defining the research problem-research design.

Unit-II

Proposition and Logical operations- Conditional Statements-Methods of Mathematical induction-Proof.

Unit-III

Programming in MATLAB-Polynomials, Curve fitting and interpolation

Educational Technology

Unit-IV

Origin, history, meaning and definitions of Educational technology-objectives, forms and approaches-scope, significance and use of educational technology-system concept-types-parameters-steps involved in system approach-education system-instructional system.

Unit-V

Meaning of information and communication technology (ICT)-Definition-features-trendsuses and limitations-characterizes of e-learning-advantages and limitations-Integration of ICT in teaching and learning-ICT applications: using word processors, spread sheets ,power point slides in the class room-ICT for research: on-line journals, e-books ,technical reports, theses and dissertations-computer mediated teaching: Multimedia, e-content.

Text Books

[1] C.R.Kothari,Research Methodology, WISWA PRAKASHAN, 1990.
[2] B.Kolman,R.C.Busby and S.C.Ross,Discrete Mathematical Structures,Fourth India reprint,Pearson education Pvt.Ltd,2003.
[3] Amos Gilat, MATLAB An introduction with applications,John Wiley & Sons,2004.
[4] S.K.Mangal and Uma Mangal, Essentials of Educational technology, Prentice Hall of India PvtLtd., New Delhi, 2009.
[5] R.A.Sharma, Fundamentals of Educational technology, Surya Publications, Meerut, 2006.
[6] Michael.D and William, Integrating Technology into teaching and Learning: Concepts and Applications, Prentice Hall, New York, 2004.
[7] Kumar K.L, Educational technology, New Age International Publishers, 2008.

For Unit I Chapters I,II & III of [1]
For Unit II Chapters II of [2].
For Unit III Chapters 7&8 of (3).
For Units IV and V relevant chapters in [4], [5], [6], [7].

ALGEBRA AND ANALYSIS - M16MS2

Semester: I **Core Course : II**
Instruction Hours/Week: 4 **Credit :4**

Unit I
Module homomorphism and exact sequence-projective and injective modules-homomorphism and duality.

Unit II
Chain conditions-prime and primary ideals - primary decomposition-Noetherian rings and modules.

Unit III
Convex funtions and inequalities- L^p spaces- Approximation by continuous functions.

Unit IV
Formal properties of Fourier Transform -Inversion Theorem-Plancherel Theorem-Banach Algebra L^1**.**

Unit V
Preservation of angles - Linear fractional transformations-normal families-Riemann mapping theorem.

Text Books
[1] Thomas W.Hungerford, Algebra, Springer Verlag, Indian reprint 2004.
[2] Walter Rudin, Real and Complex Analysis,Mc Graw Hill International 3rd edition,1986.

For Unit I Chapter 4: 4.1, 4.3&4.4 of [1].
For Unit II Chapter 8: 8.1-8.4 of [1].
For Unit III Chapter 3 of [2].
For Unit IV Chapter 9 of [2].
For Unit V Chapter 14 (Pages 278-289)

TOPOLOGY, DIFFERENTIAL EQUATIONS AND GRAPH THEORY - M16MS3

Semester: I **Core Course : III**
Instruction Hours/Week: 4 **Credit :4**

Unit I
Homotopy of paths-Fundamental Group- Covering spaces-fundamental group of the circle.

Unit II
Uncoupled Linear systems-Diagonalisation-Exponentials of operators-Fundamental theorem for linear systems- Linear systems in R2 - complex eigen values-multiple eigen values-Jordan Forms-Stability theory-Non-homogeneous linear systems.

Unit III
Factorization and Decomposition of graphs

Unit IV
Fuzzy sets-fuzzy operators-fuzzy relations-composition of fuzzy relations-properties of fuzzy relation.

Unit V
Introduction of fuzzy graph-operations on fuzzy graphs-complement of fuzzy graphs-cartesian product and composition- union and join.

Text Books
[1] James.R.Munkres: Topology A first course - PHI pvt.LTD,1983.
[2] L.Perco Differential Equations &Dynamical systems,Springer-Verlag,First Indian Reprint 2004.
[3] G.Chartrand and Lesniak, Graphs and Digraphs,4th edition Schapman &Hall,1996.
[4] A.Nagoorgani and V.T.Chandrasekharan, A fuzzy look at fuzzy graph theory -Allied publishers pvt.Ltd.2010.
[5] J.N.Moderson and P.S.Nair,Fuzzy graphs and Fuzzy hyper graphs.

Unit I: Chapter 8: 8.1-8.4 of [1].
Unit II: Chapter 1 of [2].
Unit III: Chapter 9: 9.2 of [3].
Unit IV & Unit V: Relevant chapters in 4 & 5.