ADVANCED MATHEMATICS COURSES LIST

COMPLETED COURSEWORK

Code	Course Title	Text Used	Instructor	Grade
MC201	**Discrete Mathematics** **Topics:** Set theory, Logic, Combinatorics, Lattices and Boolean Algebra, Graph Theory	Discrete Mathematics and its Applications by Kenneth H. Rosen	Rohit Kumar, Assistant Professor	O (10/10)
MC203	**Mathematics-III** **Topics:** Improper Integrals, Multivariable Calculus, Complex Analysis, Z-transformations	Advanced Engineering Mathematics by E. Kreyszig, Complex Analysis by Schaum Series	Dr. V. P. Kaushik, Professor	O (10/10)
MC206	**Probability and Statistics** **Topics:** Descriptive Statistics, Random Variables, Probability Distributions, Sampling, Hypothesis Testing, Applications	Statistical Methods for Engineering and Sciences by H. C. Taneja	Dr. R. Srivastava, Professor	O (10/10)
MC207	**Engineering Analysis and Design** **Topics:** Ordinary Differential Equations, Partial Differential Equations, Solutions of DE, Initial Boundary Value Problems	Differential Equations by Shepley L. Rose, Third edition	Dr. Naokant Deo, Professor	O (10/10)
MC202	**Real Analysis** **Topics:** Real-valued Functions, Real Sequences, Metric Spaces, Reimann Integral	Methods of Real Analysis by Richard R. Goldberg	Dr. S. Sivaprasad Kumar, Professor	A+ (9/10)
MC204	**Scientific Computing** **Topics:** Solution of Transcendental and polynomial equation, System of Linear Algebraic equations and Eigen value problems, Interpolation, Numerical Differentiation & Integration, Numerical solution of ODE	Numerical Methods for Scientific and Engineering Computation by M. K. Jain and S. R. K. Iyengar	Dr. V. P. Kaushik, Professor	A+ (9/10)
MC208	**Linear Algebra** **Topics:** Introduction to algebraic structure, Linear transformations, Inner product spaces, Bilinear forms	Linear Algebra by K. Hoffman and R. Kunze	Dr. Chandra Prakash Singh, Associate Professor	O (10/10)
MC303	**Stochastic Processes** **Topics:** Stochastic processes, Random Walk, Discrete and Continuous time Markov chain, Renewal process, Queuing Models	The Theory of Stochastic Processes by D. R. Cox and H. D. Miller	Dr. H.C. Taneja, Professor	O (10/10)
MC305	**Operations Research** **Topics:** Linear Programming Problems and Solutions, Duality in LPP, Integer Programming Problems, Transportation and assignment Models, Network Scheduling	Operations Research: An Introduction by Hamdy A. Taha	Dhirendra Kumar, Assistant Professor	O (10/10)

MC315	**Modern Algebra** **Topics:** Groups, Rings, Integral domains, Fields, Euclidian domain, Principal Ideal domain and Unique Factorization Domain	Contemporary Abstract Algebra by Joseph A. Gallian	Dr. Dinesh Udar, Assistant Professor	O (10/10)
MC304	**Theory of Computation** **Topics:** Automata, Formal Languages, Regular Sets, Context Free Languages, Pushdown Automata, Turing Machines	Theory of Computer Science by K. L. P. Mishra and Chandrasekaran	Dr. Sangita Kansal, Professor	A+ (9/10)
MC306	**Financial Engineering** **Topics:** Financial Market, Risk and Return, Option Pricing, Stochastic Differential Equations, Mean-Variance Portfolio Theory	Financial Engineering: An Introduction by Chandra, Dharmaraja, Mehra and Khemchandani	Dr. R. Srivastava, Professor	A+ (9/10)
MC318	**Computer Graphics** **Topics:** Overview, Output Primitives, Transformations, Two-dimensional Viewing, Curves and Surfaces, Projection, Shading and Hidden Surface Removal	Computer Graphics by D. Hearn and P. Baker	Trasha Gupta, Assistant Professor	O (10/10)

IN PROGRESS COURSEWORK

Code	Course Title	Text Used	Instructor	Grade
MC405	**Graph Theory** **Topics:** Subgraphs, Paths and Cycles, Hamiltonian and Eulerian Graphs, Trees, Cut Vertices and Edge Connectivity, Colouring of Graphs	Graph theory with applications to engineering and computer science by Narsingh Deo	Dr. Sangita Kansal, Professor	To be declared
MC407	**Cryptography and Network Security** **Topics:** Introduction, Stream and Modern Block Ciphers, Modular Arithmetic, Message Authentication and Hash Functions, Authentication Applications, IP Security and Web Security	Cryptography and Network Security: Principals and Practice by William Stallings	Anshul Arora, Assistant Professor	To be declared
MC409	**Mathematical Modeling and Simulation** **Topics:** Introduction, Difference Equations, Discrete and Continuous Dynamical Systems, Phase Plane Analysis, Regression	Mathematical Modelling with Case Studies by B. Barnes and G. R. Fulford	Dr. Vivek Kumar Aggarwal, Assistant Professor	To be declared

EXPECTED TO COMPLETE COURSEWORK (In Coming Semester)

Code	Course Title	Suggested Text	Instructor	Grade
MC404	**Matrix Computation** **Topics:** Numerical Linear Algebra, LU, QR, SVD Decomposition, Generalized Inverses, Sensitivity Analysis, Tridiagonal forms, Krylov Subspace Methods	Matrix Computations by G. H. Holub and C. F. Van Loan	To be declared	To be declared
MC406	**Partial Differential Equations** **Topics:** First order PDE, Second order PDE, Wave equation, Heat equation, Laplace equation	Elements of Partial Differential Equations by Ian N. Sneddon	To be declared	To be declared
MC432	**Fuzzy Sets and Fuzzy Logic** **Topics:** Fuzzy Sets, Fuzzy Relation, Fuzzy Logic, Fuzzy Expert Systems, Fuzzy Controllers	Fuzzy Sets and Fuzzy Logic Theory and Applications by George J. Klir and Bo Yuan	To be declared	To be Declared