SCHEME OF COURSE WORK

Course Details:

Course Title	Mathematics II			
Course Code	15BM1102	L T P C	3 1 0 4	
Program:	B.Tech.			
Specialization:	Information Technology			
Semester	II Semester			
Prerequisites	• Basic formulae of differentiation and integrations. • Basic terminology and elementary operations on Matrices and properties. • Basic concept of Partial Differentiation.			
Courses to which it is a prerequisite	: For all Engineering Courses			

PROGRAM OUTCOMES:

A graduate of Information Technology Engineering will be able to

PO1: Apply the knowledge of mathematics, science, engineering fundamentals and principles of Information Technology to solve problems in different domains.

PO2: Analyze a problem, identify and formulate the computing requirements appropriate to its solution.

PO3: Design and develop software components, patterns, processes, Frameworks and applications that meet specifications within the realistic constraints including societal, legal and economic to serve the needs of the society

PO4: Design and conduct experiments, as well as analyze and interpret data PO5: Use

appropriate techniques and tools to solve engineering problems.

PO6: Understand the impact of Information technology on environment and the evolution and importance of green computing.

PO7: Analyze the local and global impact of computing on individual as well as on society and incorporate the results in to engineering practice.

PO8: Demonstrate professional ethical practices and social responsibilities in global and societal contexts.

PO9: Function effectively as an individual, and as a member or leader in diverse and multidisciplinary teams.

PO10: Communicate effectively with the engineering community and with society at large.

PO11: Understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.

PO12: Recognize the need for updating the knowledge in the chosen field and imbibing learning to learn skills.

Course Outcomes (COs):

1	Solve the linear system of equations analytically and compute Eigen values and eigenvectors of a square matrix.
2	Numerically solve linear system of equations and compute eigen values and eigenvectors of a square matrix.
3	Discuss and demonstrate difference equations to discrete systems.
4	Calculate Fourier series and Fourier transforms for certain functions.
5	Classify and solve partial differential equations and apply it to heat flow and wave propagation problems.

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1	3	3			3										
CO-2	3	2			2										
CO-3	3	3													
CO-4	3	3													
CO-5	3	3													

S - Strongly correlated, M - Moderately correlated, Blank - No correlation

Assessment	Assignment / Quiz / Seminar / Case Study / Mid-Test / End

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sa ıple questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Solve the linear system of equations analytically and compute Eigen values and eigenvectors of a square matrix.	CO-1	1) If A □ 1 1 3 □□ □ □ 1 3 □ 3 , find A□1 □ □□ 2) □□□ 2 □ 4 □ 4□□□ by Cayley Hamilton Theorem. 3) Find the value of □ for which the system of equations 3x □ y □ 4z □ 3, x □ 2 y □ 3z □ □2, 6x will have infinite number of solutions and solve them with that □ value. Verify Cayley Hamilton Theorem for the Matrix A □ □2 1 1□□ □ □ 0 1 0 . □ □□ □□1 1 2□□□	Lecture / Problem solving	Assignment (Week 2 - 4) / Quiz-I (Week -8)/ Mid-Test 1 (Week 9)
2	Numerically solve linear system of equations and compute eigen values and eigenvectors of a square matrix.	CO-2	1) Using factorization method to solve the equations 3 + 2 + 7 = 4, 2 + 3 + = 5, 3 + 4 + = 7 the 2) Gauss-Seidel method to solve the	Lecture / Problem solving	Assignment (Week 2 - 4)/ Quiz -I (Week -8)/ Mid-Test 1 (Week 9)

			equations $2x + 6y + 9z = 8$, $3x + 2y + 13z = 5$, $x + y + z = 7$ 3) Using Rayleigh's power method, find the largest eigen value and corresponding eigen vector of $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$		
3	Difference operators (forward, backward and shift operators)	CO-3	1) Find $\Delta^2 (x^2+5x+6)$	Lecture / Problem solving	Mid-Test 1 (Week 9)/ Assignment (Week 2 - 4)/ Quiz -I (Week -8)
4	Mid-Test 1	-----	----------	-------	----------
5	Linear difference equations and it's complete solution. Rules for finding the complementary function and complete integral, Deflection of a loaded string.	CO-3	1) Solve the difference equation $y_{x+2} - 2y_{x+1} + y_x = 2^x$	Lecture / Problem solving	Mid-Test 2 (Week 18) / Quiz -II (Week -17)/ Assignment (12-14)
6	Calculate Fourier series and Fourier transforms for certain functions.	CO-4	1) Find the Fourier Series for $f(x) = e^{-x}$ in $0 < x < 2\pi$. 2) Find the Fourier Series for $f(x) = x^2$ in $0 < x < 2\pi$. 3) Find the Fourier Transform of $f(x) = \begin{cases} 1, & \text{if } \lvert x \rvert < 1 \\ 0, & \text{if } \lvert x \rvert > 1 \end{cases}$	Lecture / Problem solving	Mid-Test 2 (Week 18) / Quiz -II (Week -17)/ Assignment (12-14)
7	Classify and solve PDE and apply it to heat flow and wave propagation problems.	CO-5	1) Find the partial DE for $z = f(x+y) + g(x-y)$ by eliminating f and g. 2) Solve $\nabla^2 V = 0$ subject to	Lecture / Problem solving	Mid-Test 2 (Week 18) / Quiz -II (Week -17)/ Assignment (12-14)
8	Mid-Test 2				
9	END EXAM				