KALASALINGAM UNIVERSITY,
ANAND NAGAR, KRISHNANKOIL –626 126

COURSE PLAN

SUB AND CODE : **MAT202 / Mathematics III**
SEM/BRANCH : **Third / ALL**
NAME OF THE STAFF : **Faculties of Maths,**

PRE-REQUISITE:
MAT103, MAT104, Basic differential and integral calculus.

OBJECTIVES:

1. To demonstrate how differential equations can be useful in solving many types of problems - in particular, to show how to translate problems into the language of differential equations, to find or numerically approximate the solution of the resulting differential equation subject to given conditions, and to interpret the solutions obtained.
2. To study Fourier series and solve boundary values problems. .
3. To understand Fourier Transform, the convergence issues, relation to Fourier Series
4. To understand the properties of Fourier Transform, use these to derive Fourier Transforms for related signals
5. To know the various definitions of the Fourier Transforms, sufficient conditions for its existence how to compute inverse Fourier Transform.
6. To know the various rules (convolution Theorem etc) for the Fourier and z-transform and how to use them.

COURSE LEARNING OUTCOMES AND END USE

1. Find general solutions to first order partial differential equations that are exact separable, or linear
2. Find solutions of these types subject to given conditions
3. Find Fourier transform, sine and cosine transform given functions.
4. Find z-transform of given functions
5. Solve difference equations using z-transform.

TEXT BOOK:

1. Grewal, B.S., Grewal, J.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 37th Edition, 5th Reprint 2004, 2003
2. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Engineering Mathematics Volume II, Scitech Publications (India) Pvt. Ltd., Chennai, 1st Edn., Reprint 2000, 1999

REFERENCE BOOKS

1. Kreyszig, E., Advanced Engineering Mathematics, John Wiley and Sons (Asia) Limited, Singapore, 8th Edition., 2001
2. Venkataraman, M. K., Engineering Mathematics –III A, The National Publishing Company, Chennai, 11th Edition., Reprint 2002, 1998
3. Venkataraman, M. K., Engineering Mathematics - III B, The National Publishing Company, Chennai, 13th Edition., Reprint 1999, 1998

S. No.	Topic	Ref. Book	No. of periods	Cumulative Hours
	PARTIAL DIFFERENTIAL EQUATIONS			
1.	Formation of partial differential equation	R1, R2	1	2
2.	Solution of standard types of first order Partial differential equations	R1, R2	3	5
3.	Lagrange's Linear Equation	R1, R2	2	7
4.	Linear partial differential equations of second and higher order with constant coefficients.	R1, R2	3	9
	LAPLACE TRANSFORM			
5	Definition of Laplace transform - Linearity property - condition for existence of Laplace transform	R1, R2	1	10
6	First and second shifting properties, Laplace transform of derivatives and integrals	R1, R2	1	11
7	Unit step functions - Diarc delta-function, Differentiation and integration of transforms	R1, R2	1	12
8	Convolution theorem	R1, R2	2	14
9	Periodic functions - Inversion	R1, R2	1	15
10	Evaluation of integrals by Laplace transform	R1, R2	1	16
11	Solution of boundary value problems	R1, R2	2	18
	FOURIER SERIES			
12	Dirichlet's conditions	R1, R2	1	19
13	General Fourier series, Odd and even functions	R1, R2	2	21
14	Half-range sine and cosine series	R1, R2	2	23
15	Complex form of Fourier Series	R1, R2	1	24
16	Parseval's identity	R1, R2	1	25
17	Harmonic analysis.	R1, R2	2	27
	Z -TRANSFORM			
18	Z-transform - Elementary properties	R1, R2	2	29
19	Inverse Z-transform	R1, R2	2	31
20	Convolution theorem	R1, R2	2	33
21	Formation of difference equations	R1, R2	1	34
22	Solution of difference equations.	R1, R2	2	36
	FOURIER TRANSFORM			
23	Fourier integral formula	R1, R2	1	37
24	Fourier transform pair	R1, R2	2	39
25	Fourier Sine and Cosine Transform	R1, R2	3	42
26	Properties (Linear, frequency shifting, time shifting and self reciprocal of Fourier Transform)	R1, R2	2	44
27	Convolution theorem.	R1, R2	1	45

SESSIONAL EXAM	TOPIC NUMBERS
1	1 – 11
2	12 – 22

Staff in Charge **HOD /MATHS**