Lesson Plan

Faculty: Prasad Lalit

CLASS		**SE Electronics, Semester III**	
Academic Term		**July – November 2019**	
Subject : **ELX 301**		**Applied Mathematics 3**	
Periods (Hours) per week	***Lecture***	***4***	
	Practical	***--***	
	Tutorial	***1***	
Evaluation System		***Hours***	***Marks***
	Theory examination	3	80
	Internal Assessment	--	20
	Practical Examination	--	--
	Oral Examination	--	--
	Term work	--	25
	Total	--	125

Time Table	***Day***	***Time***
	Monday	2.30 – 3.30
	Tuesday	11.00 – 12.00
	Wednesday	12.00 – 01.00
	Thursday	12.00 – 01.00

Course Content and Lesson plan

Module 1: **Laplace Transform**

Week	**Lecture No.**	**Date**		**Topic**	**Remarks (If any)**
		Planned	**Actual**		
1	1	02 – 07 – 19	03 – 07 – 19	Laplace transform of elementary functions	Lecture adjustment on 02-07-19, 05-07-19 (due to Mrs.
	2	03 – 07 – 19	09 – 07 – 19	Laplace transform – Change of scale, shifting theorems	
	3	05 – 07 – 19	12 – 07 – 19	Laplace transform – Multiplication and division by t	
2	4	09 – 07 – 19	12 – 07 – 19	Laplace transform – Derivative and integration properties	

	5	10 – 07 – 19		Laplace transform – Examples on properties	Prabavathy Madam's load) and on 10-07-19 (OD)
Module 2: **Inverse Laplace Transform and its applications**					
	6	12 – 07 – 19	12-07-19	Inverse Laplace Transform – Formulas and properties	
3	7	15 – 07 – 19	12-07-19	Change of scale, convolution, multiplication and division	Extra Class of Prof. Heena
	8	16 – 07 – 19		Inverse Laplace Transform – Derivative and integration	
	9	17 – 07 – 19		Laplace transform – Periodic and Heaviside functions	
	10	18 – 07 – 19		Laplace transform – Heaviside and Dirac-delta function	
4	11	22 – 07 – 19		Solving differential equations using Laplace transform	
Module 3: **Fourier Series**					
	12	23 – 07 – 19		Fourier Series – Introduction	
	13	24 – 07 – 19		Fourier Series – Discontinuities at intermediate and end points	
	14	25 – 07 – 19		Fourier Series – Examples of length 2π , Parseval's identity	
5	15	29 – 07 – 19		Fourier Series – Examples of length $2l$ (general interval)	
	16	30 – 07 – 19		Half-range Fourier series	
	17	31 – 07 – 19		Half-range Fourier series	
	18	01 – 08 – 19		Half-range Fourier series – Parseval's identity	
6	19	05 – 08 – 19		Complex form of Fourier series	
	20	06 – 08 – 19		Complex form of Fourier series	
	21	07 – 08 – 19		Orthogonal and orthonormal set of functions	
Module 4: **Complex Variable and Bessel Functions**					
	22	08 – 08 – 19		Analytic functions	
7		13 – 08 – 19		Unit Test 1	
		14 – 08 – 19			

		16 – 08 – 19			
8	23	19 – 08 – 19		Cauchy-Riemann equations in Cartesian and Polar form	
	24	20 – 08 – 19		Harmonic functions and Milne-Thompson method	
	25	21 – 08 – 19		Orthogonal Trajectories	
	26	22 – 08 – 19		Extension to polar form, Laplace equation in polar	
9	27	26 – 08 – 19		Conformal Mapping	
	28	27 – 08 – 19		Bilinear Transformation	
	29	28 – 08 – 19		Fixed points of Bilinear Transformation	
	30	29 – 08 – 19		Mapping; Inversion, Image under transformation	
10		02 – 09 – 19		Mid Term Break	
		03 – 09 – 19			
		04 – 09 – 19			
		05 – 09 – 19			
11	31	09 – 09 – 19		Bessel's Differential Equation	
	32	11 – 09 – 19		Properties of Bessel Function of orders ½ and -1/2	
	33	12 – 09 – 19		Generating Function	
12	34	16 – 09 – 19		Expression of $cos(xsin\,\theta), sin(xsin\theta)$ in term of Bessel Functions	
Module 5: **Vector Algebra and Vector Differentiation**					
12	35	17 – 09 – 19		Scalar and Vector Products	
	36	18 – 09 – 19		Vector Differentiation and Gradient of Scalar Point Function	
	37	19 – 09 – 19		Curl and Divergence of Vector Point Function	
13	38	23 – 09 – 19		Solenoidal and Irrotational Vector Fields	
	39	24 – 09 – 19		Conservative Vector Field	
Module 6: **Vector Integral**					
	40	25 – 09 – 19		Line Integral	
	41	26 – 09 – 19		Line Integral	
14	42	01 – 10 – 19		Green's Theorem	
	43	03 – 10 – 19		Green's Theorem	
	44	04 – 10 – 19		Gauss' Divergence Theorem	

15	45	07 – 10 – 19		Gauss' Divergence Theorem	
	46	09 – 10 – 19		Stoke's Theorem	
	47	10 – 10 – 19		Stoke's Theorem	
16		14 – 10 – 19		Unit Test 2	
		15 – 10 – 19			
		16 – 10 – 19			
		18 – 10 – 19		Term END	

Text Books:

1. H.K. Das, "*Advanced engineering mathematics*", S . Chand, 2008
2. A. Datta, *"Mathematical Methods in Science and Engineering",* 2012
3. B.S. Grewal, *"Higher Engineering Mathematics",* Khanna Publication

Reference Books:

1. B. V. Ramana, *"Higher Engineering Mathematics",* Tata Mc-Graw Hill Publication
2. Wylie and Barret, *"Advanced Engineering Mathematics",* Tata Mc-Graw Hill 6th Edition
3. Erwin Kreysizg, *"Advanced Engineering Mathematics",* John Wiley & Sons, Inc
4. Murry R. Spieget, *"Vector Analysis",* Schaum's outline series, Mc-Graw Hill Publication

Internal Assessment:
Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the tests will be considered as final IA marks

Semester End Theory Examination:
1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. The students need to solve total 4 questions.
3. Question No.1 will be compulsory and based on entire syllabus.
4. Remaining question (Q.2 to Q.6) will be selected from all the modules.
5. Weightage of each module in question paper will be proportional to the number of respective lecture hours mentioned in the syllabus.

Submitted By	**Approved By**
Prof. Prasad Lalit	i) Prof. Narayanan kallingal Sign:
Sign:	ii) Dr. D V Bhoir Sign:
	iii) Prof. Shilpa Patil Sign:

	iv) Prof. Monica Khanore Sign:
Date of Submission: 15 – 07 – 2019	**Date of Approval:**
Remarks by PAC (if any)	