KL UNIVERISTY
FIRST SEMESTER 2010-11
Course Handout
Academic Division

Dated: 07-07-2010

Course No. : **MATH C 202**
Course Title : **Engineering Mathematics-III**
Course Structure : **3-1-0**
Course coordinator : **Mr B V Appa Rao**
Instructors : **Mr BV Appa Rao, Dr G Suresh Kumar**

1. Course Description:

Fourier Series, Dirichlet's conditions, change of interval, Fourier series for even and functions, Half range series, Prseval's Identity, Fourier Integrals, Fourier Transforms, Fourier sine and cosine transforms, Finite Fourier sine and cosine transforms. Numerical Differentiation by using Newton's method, Numerical Integration, Solutions of First order differential equations using numerical methods and sets, relations functions and inverse functions.

2. Scope and Objective of the Course:

The course is designed for the second year first semester students. The course will provide an overview of the study of Fourier series and Fourier transforms . Further, the students will understand how the course instructions are useful in mathematical modeling.

Its needless to state that any engineering problem must be suitably mathematically modeled and the solution must be studied in detail for its physical interpretation and viability.

At the end of the course, the student should be able to understand

>Fundamental knowledge of mathematical modeling

>obtaining solutions of such mathematically modeled problems

>Give physical interpretation for the solutions obtained.

Pre requisites: Thorough knowledge of integral and differential calculus.

3. Books:

(i) Textbook:

1) Higher Engineering Mathematics by B.S.Grewal,40th Edition. Khanna publishers, New Delhi.
2) Discrete Mathematics for computers Scientists & Mathematicians, second edition,PHI,New Delhi J.L.Mott , A.Kandel and Th.P Baker.

(ii) Reference Book:

1. Advanced Engineering Mathematics by Ervin Kreyszic,8th Edition, Jhon wiley student edition, New Delhi.
2. Higher Engineering Mathematics by B.V.Ramana, TMGH.
3. Introductory methods of Numerical Analysis, Raja Raman, Pearson Education

4. Syllabus:

UNIT-I

Fourier Series: Introduction, Euler's formula, Condition for a Fourier Series, change of interval, even and odd functions, expansions of even and odd functions. Half range series, Parseval's formula, Complex form of Fourier Series, Harmonic Analysis.

UNIT-II

Integral Transforms: Definition, Fourier Integrals, Fourier sine and cosine integrals. Complex form of Fourier integrals, Fourier Theorems, Fourier Trans forms, Fourier sine and cosine transforms, Finite Fourier transforms, Finite Fourier sine and cosine transforms, Fourier transform of derivative of a function.

UNIT-III

Numerical Differentiation: Finding out first and second order differentials using Newton's formula.

Numerical integration: Trapizoidal's rule, Simpson's rule, Gauss quadrature formula, numerical solution of ordinary differential equation, Euler's, Modified Euler's method, Runge kutta method of 4^{th} order.

UNIT-IV

Solving ordinary differential equations: Taylor's method, Picard's method. Boundary value problems. Solutions of Laplace and Poisson's equations by integration method.

UNIT-V

Set Theory:

Set operations, Theorems on functions, relations, properties of relations, Equivalence relations, Venn diagrams, inverse of a function, Groups.

5.Course Plan:

Lecture No.	Learning Objective	Topics to be covered	Reference
1	**UNIT-I** Introduction	Definite, Indefinite integral, even an odd functions, significance of Fourier series	T1 10.1-10.11
2	Periodic functions	Periodic functions	
3	Fourier Series	Definition of Fourier series, Fourier series expansions	
4	Euler's Formula	Derivation of Euler's formula	
5	Discontinuous functions	Fourier series for functions having discontinuous points.	
6	Change of interval	Fourier expansion in the interval(-L,L)	
7	Even and odd functions	Fourier expansion for Even and odd functions.	
8	Even and odd functions	Fourier expansion for Even and odd functions.	
9	Half range series	Fourier expansion for functions defined in half range series	
10	Half range series	Fourier expansion for functions defined in half range series	

11	Parsevel's Formula	Using Parseval's identity develop the standard identities	
12	Harmonic analysis	Practical Harmonic analysis	
13	**UNIT-II** Introduction	Fourier Trans forms and its significance	T1 22.1-22.4 and 22.9
14	Fourier Integrals	Evaluations of integrals by using Fourier integrals	
15	Fourier sine integrals	Evaluation of integrals by using Fourier sine integrals	
16	Fourier cosine integrals	Evaluation of integrals by using Fourier cosine integrals	
17	Complex Fourier integrals	Evaluation of integrals by using complex Fourier	
18	Fourier Transforms	Finding Fourier Transform of a given Function	
19	Finite Fourier Trans forms	Finding Finite Fourier Sine transforms of a given function	
20	Finite Fourier Trans forms	Finding Finite Fourier cosine transforms of a given function	
21	Transforms of derivatives	Applications of Fourier Transforms	
22	Transforms of derivatives	Applications of Fourier Transforms	
23	**UNIT-III** Introduction	Usage of Numerical Differentiation and integration	T1 29.10
24	Newton's formula	Evaluation of first and second order differentials by numerically.	
25	Numerical Integration	Trapizoidal 's rule	T1 29.12
26	Numerical Integration	Trapizoidal's rule	
27	Numerical Integration	Gauss quadrature formula	
28	Numerical Integration	Gauss quadrature formula	
29	Solution of ordinary differential equations	Euler's method, Modified Euler's method and RK 4^{th} order method	T1 31.4,31.5&31.7
30	Solution of ordinary differential equations	Modified Euler's method	
31	Solution of ordinary differential equations	RK 4^{th} order method	
32	Solution of ordinary differential equations	Rk 4^{th} order method	
33	**UNIT-IV** Solutions of ordinary differential equations	Taylor's method	T1 31.1-31.3

34	Solutions of ordinary differential equations	Picard's method	
35	Solutions of ordinary differential equations	Picard's method	
36	Boundary value problems	Solving BVP by using Numerical methods	T1 31.11
37	Boundary value problems	Solving BVP by using Numerical methods	
38	Laplace equation	Solving Laplace equation by integration method	
39	Poisson's equation	Solving Poison's equation by integration method	
40	**UNIT-V** Introduction	Significance of Sets, relations functions	T2 1.1-1.3&4.3
41	Sets	Properties of Sets	
42	Relations	Theorems on relations	
43	Relations	Properties of relations	
44	Functions	Theorems on functions and inverse functions	
45	Groups	Properties of Groups	

6.Self learning material:

S.No	Unit	Topic	Source
1	I	Periodic, Even &odd functions	T1
2	II	Newton's formula Simpson's Rule	T1
3	III	Solving ordinary differential equations	T1
4	V	Sets &Venn diagrams	T2

7.Evaluation Scheme:

Component	Duration (minutes)	% Weightage	Marks	Date & Time	Venue
Test-1	50 Min	10	10	09-08-2010 9.30 to 10.20 A.M	CSE001, 002, 004, 005, 101, 102,104, 105, 106,201, 204, 205,301, 502, 509, NSH
Test-2	50 Min	10	10	13-09-2010 9.30 to 10.20 A.M	CSE001, 002, 004, 005, 101, 102,104, 105, 106,201,

					204, 205,301, 502, 509, NSH
Assignement submission		5	5	Continuous	
Assignment Test	50 Min	5	5	25-10-2010 9.00 to 10.20 A.M	CSE001, 002, 004, 005, 101, 102,104, 105, 106,201, 204, 205,301, 502, 509, NSH
Quiz	30 Min	5	5	25-10-2010 9.00 to 10.20 A.M	CSE001, 002, 004, 005, 101, 102,104, 105, 106,201, 204, 205,301, 502, 509, NSH
Regular Lab Evaluation	Continuous	0	0		
Comprehensive Lab Exam	3 Hrs	0	0		
Comprehensive Exam	3 Hrs	60	60		
Attendance for Theory & Tutorial		5	5	Continuous	
Attendance for Lab		0	0	Continuous	

8. Chamber consultation hour: Informed in the class in first week.

9. Notices: All notices regarding the course will be put in E-learning website.

10.Tutorial: Tutorial will be conducted by the respective in charge faculty. The tutorials are planned to supplement the material taught in the lectures and clear doubts. Student must attend registered section for tutorial in the respective classroom. Class assignment, class tests and other evaluation components will also be conducted during tutorials. Students must actively participate in the tutorial and come prepared for it.

Course Coordinator