

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI- HYDERABAD CAMPUS
INSTRUCTION DIVISION, FIRST SEMESTER 2016-2017
COURSE HANDOUT (PART-II)

Date: 01.08.2016

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **MATH F211**
Course Title : **MATHEMATICS - III**
Instructor-in-charge : **T S L Radhika**
Instructors : **A Ramu, Anil N, Jagan Mohan J, K Venkat Ratnam, Kishore Kumar, P K Sahoo, P T V Praveen Kumar**

1. Scopes and Objective of the Course:

This Course reviews and continues the study of differential equations with the objective of introducing classical methods for solving boundary value problems. This course serves as a basis of the applications for differential equations, Fourier series and Laplace transform in various branches of engineering and sciences. This course emphasizes the role of orthogonal polynomials in dealing with Sturm-Liouville problems.

2. Text Book: Simmons G.F., Differential Equations with Applications and Historical Notes, TMH Edition 2003, Twelfth reprint 2008

Reference Book: 1. Kreider D.L. and Others: An Introduction to Linear Analysis, A.W., 1966.

2. Shepley L. Ross: Differential Equations, John Willy & Sons, 1984.

3. Course Plan: (Sections/Articles refer to Text Book)

Lect No.	Learning Objectives	Topics to be covered	Sections
1	To introduce the classical methods to solve 1 st order equations	First order eqns (Self -study)	1-7
2-4		First order equations	8-10
5		Reduction of order	11
6-7	To introduce the classical methods to solve 2 nd order equations	Second order equations	14,15
8		Use of a known solution	16
9-12		Various methods to solve diff. Eqns	17-19,22,23
13-14	To introduce systems of equations	Systems of Equations	54-56
15-16	Properties of solutions	Sturm Separation Theorem and Sturm Comparison Theorem	24, 25
17-19	To introduce Series Solutions method to 2 nd order diff. Equation with variable coefficients	Series Solutions	26-30
20-21		Hypergeometric equation	31
22-24		Legendre Polynomials	44,45
25		Chebyshev Polynomials	Appendix D
		Hermite Polynomials (Self-study)	Appendix B
26-28		Bessel functions	46,47

29-32	Use LT to solve DE and Integral Equations	Laplace Transforms	48-53
33-35	To introduce trigonometric series expansion of a function	Fourier Series	33-36
37-39	To introduce classical methods to solve PDE	Eigen values and Eigen functions Sturm Liouville Problems	40, 43
40		One dim. Wave eqn	40
41		One dim. Heat eqn	41
42		Laplace's eqn (Self Study)	42

4. Evaluation Scheme :

Evaluation Component	Duration	Weightage	Date & Time	Nature of Component
Test I	60 min.	30%	9/9, 8.30-9.30 AM	Closed Book
Test II	60 min.	30%	24/10, 8.30-9.30 AM	Open Book
Compre. Exam.	3 hrs.	40%	03/12 FN	Closed Book

5. Make-up:

(i) Make up will be granted only in genuine cases. Permission must be taken in advance except in extreme cases.

(ii) No MAKE-MAKE-UP will be entertained.

6. Chamber consultation hour: To be announced in their class by the respective instructors.

7. Notices: All notices regarding MATH F211 will be put on CMS.

**Instructor-in-charge
MATH F211**