BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

HYDERABAD CAMPUS
INSTRUCTION DIVISION
FIRST SEMESTER 2012-2013
Course Handout (Part-II)

Date: 26/07/ 2012

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 / MATH C241**
Course Title   **: MATHEMATICS - III**
Instructor-in-charge   **: Dr. T S L RADHIKA**
Instructors   **: Prof. A. Ramu, Dr. K. Venkata Ratnam, Dr. P.K. Sahoo,**
                            Dr. P T V Praveen Kumar, Dr. Sashideep Gutti,
                            Dr. Akhlad Iqbal

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:

1. Simmons G.F., Differential Equations with Applications and Historical Notes, TMH, 2nd ed.,1991.

Reference Book:

1. Edwards & Penney: Differential Equations and Boundary value problems, Pearson Education, 3rd ed.
2. Shepley L. Ross: Differential Equations, Willy India Pvt. Ltd, 3rd ed.
3. Birkhoff & Rota: Ordinary Differential Equations, Wiley India Pvt. Ltd., 4th ed.
4. Zill, Differential Equation, Thomson Learning, 5th ed., 2004
5. R.K. Patnaik: Differential Equation, PHI, 2009.

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

Lect No.	Learning Objectives	Topic	Sections	Home work (Page-problems
1	To introduce the classical methods to solve 1st order equations	First order equations	1-7	Rev & self study
2-3		First order equations	8,9,10	All page 53, 1-4, page 59 1 to 4, page 61
4		Reduction of order	11	1 to 3, page 65
5-6	To introduce the classical methods to solve 2nd order equations	Second order equations	14,15	4 to 8, page 86 1to 4, page 91
7		Use of a known solution	16	All page 94
8-11		Various methods to solve diff. Eqns	17,18,19	1-2, page 97 & 5-8, page 98 All page 103, All page 106
12-13	Properties of solutions	Sturm Separation Theorem and Sturm Comparison Theorem	24, 25	2-4, page 161 All page 164

14-16	To introduce Series Solutions method to 2nd order diff. Equation with variable coefficients	Series Solutions	26 to 30	1-2, page 175 All page 182 1- 5, page 191 1 – 5, page 198
17-18		Hypergeometric equation	31	All page 203
19-20		Legendre Polynomials	44,45	1-2, & 4, 341 1-5, page 347
21		Hermite and Chebyshev polynomials (Any one of them and another for self study)	Appendix B & D	
22-24		Bessel functions	46,47	1- 6, page 356 1- 5363
25-26		Eigenvalues and eigen functions Sturm Liouville Problems	40,43	1, page 308
27-30	Use LT to solve DE and IE	Laplace Transforms	48,49,50,51,53	All, page 384 All, page 388 All, page 394 1- 4, page 398 2,3,4, page 410
31-32	To introduce systems of equations	Systems of Equations	54,55,56	1,2, page 420 5-9, page 426 1 and 5, Page 433
33-36	To introduce F series	Fourier Series	33,34,35,36	1-6, page 256 1-5, page 263 All, page 269 1-7, page 274
37	To introduce classical methods to solve PDE	One dim. Wave eqn	40	5, page 310
38		One dim. Heat eqn	41	
39-40		Laplace's eqn (Self Study)	42	

4. Home Assignment : All problems listed are for Home work.

5. Evaluation Scheme :

S. No.	Evaluation Component	Duration	Weightage (in %)	Date & Time	Nature of Component
1.	Test I	1 hr.	30	21/09/2012 9.30-10.30AM	Close Book
2.	Test II	1 hr.	30	02/11/2012 9.30-10.30AM	Open Book
3.	Comprehensive	3 hrs.	40	03/12/2012 AN	Close Book

6. Make-up: Make-up will be given only in genuine cases after strict verification.

7. Chamber consultation hour: To be announced in the class by the respective instructor.

8. Notices: All notices regarding MATH F211/MATH C241 will be put on Mathematics department Notice Board.

Instructor-In-Charge
MATH F211 /MATH C241