BITS PILANI, K K BIRLA GOA CAMPUS

INSTRUCTION DIVISION

FIRST SEMESTER 2012-2013

Course Handout (Part-II)

Date: 03/08/2012

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 : **MANOJ KUMAR PANDEY**
Instructors : **P. Dhanumjaya, V. K. Singh, Jajati Keshari Sahoo, G. Samanta**

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 for the applications of 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:

George F. Simmons, *Differential Equations with Applications and Historical Notes,* TMH, 2nd Ed., 1991.

Reference Books:

1. Erwin Kreyszig, Advanced *Engineering Mathematics*, John Wiley & sons, 8th Ed., 2005.

2. W. E. Boyce and R. C. Diprima, *Elementary Differential Equations and Boundary Value Problems*, John Wiley & sons, 7th edition, 1991.

3. Edwards Penney, *Differential Equations and Boundary Value Problems*, Pearson, 3rd Ed., 2009.

4. George F. Simmons and Steven G. Krantz, *Differential Equations. Theory, Technique and Practice*. TMH, 2007.

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

Lect. No.	Learning Objectives	Topic	Sections	Assignments (Page No-Problems)
1	To introduce the classical methods to solve 1st Order Differential Equations	Introduction, Solutions of Differential Equation, Picard's Theorem, Orthogonal Trajectories	1-6	**Self Study***
2		First order equations	7-10	**49-** 1, 3-6**, 53**-All, **59**-All **61**- 1 to 4
3		Reduction of order	11	**65**-1 to 3
4-5	To introduce the classical methods to solve 2nd Order Differential Equations	Second order equations	14, 15	**86**-4 to 8, **91**-1 to 4
6		Use of a known solution	16	**94**-All
7-11		Various methods to solve Differential Equations	17,18, 19	**97**-All, **103**-All, **106-** All

12-13		Higher Order Equations and Operator Methods	22, 23	**127**-1 to 8, **135**-All
14-17	To introduce Power Series Solutions to 2^{nd} order DE's with variable coefficients	Series Solutions	26 to 30	**175**-1, 2, **182**-1 to 7. **191**-1 to 5, **198**-1 to 5
18-19		Hypergeometric Equation	31	**203**-All
20-22		Legendre Polynomials	44, 45	**340**-1, 2, 4 **347**-1 to 5
23-25		Bessel Functions	46, 47	**356**-1 to 6, **363**-1 to 5
26-28		Eigenvalues and Eigen Functions, Sturm Liouville Problems	40, 43	**308**-1
29-30	To introduce systems of equations	Systems of equations	54, 55, 56	**420**-1, 2; **426**-5 to 9 **433**-1 to 5
31-34	Use Laplace Transform to solve Differential Equations	Laplace Transforms, Application to Differential Equations.	48, 49, 50, 51, 52	**384**-All, **388**-All, **394**-1 to 5, **397**-1 to 8, **410**-2, 3, 4
35-40	To introduce Fourier Series	Fourier Series	33, 34, 35, 36	**256**-1 to 6, **263**-1 to 5, **269**-All, **274**-1 to 7
41	To introduce Partial Differential Equations	Partial Differential Equations		**Review**
42-44	To introduce classical methods to solve PDE's	Wave Equation, Heat Equation and Laplace Equation.	40, 41, 42	

*__Questions can be asked in tests, quiz and comprehensive exam.__

4. Evaluation Scheme:

EC No.	Evaluation Component	Duration	Weightage (%)	Date and time	Remarks
1	Test I	1 hour.	25	16-09-2012, 2:00 PM – 3:00 PM	Closed Book
2	Test II	1 hour.	25	29-10-2012, 2:00 PM – 3:00 PM	Open Book
3	Surprise Quiz	-	10	To be announced	
4	Comprehensive Exam	3 hours	40	10-12-2012 (AN)	Closed Book

5. Make-up: Make-up will be given only in genuine cases and for that, prior permission must be obtained from I/C.

6. Chamber consultation hour: To be announced in the class.

7. Notices: All notices regarding MATH-III will be displayed on Moodle server.

Instructor In-Charge
MATH - III