1.3 Semester 3

BA223 **Mathematics III**

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
BA124	3	3	2	2	0	3

COURSE AIM

To study methods of solving ordinary differential equations which arise as a mathematical modelling in many topics of engineering. Also studying the Laplace Transforms and Fourier series.

COURSE WEEKLY CONTENTS

1	First order Differential Equations: Separable of variables- Initial value problem - Homogeneous Equations
2	First order Differential Equations: Total differential and Exact Equations - Linear Equations
3	First order Differential Equations: Bernoulli's Equation - Revision on First order Differential Equations
4	Second order Differential Equations with constant coefficients: Fundamental set of solutions - Linear independence of solutions: Wronskian - General solution of homogeneous equations
5	Second order Differential Equations with constant coefficients: Non-homogeneous Equations -Method of undetermined coefficients
6	Second order Differential Equations with constant coefficients: Non-homogenous Equations - Method of undetermined coefficients (Case of duplication) - The Method of variation of parameters
7	Second Order Differential Equation with variable coefficients: Euler-Cauchy Equations + Midterm Exam
8	Laplace transform: Basic definition - First Shifting Theorem (s-shifting)
9	Laplace transform: Transform Differentiation - Transform Integration
10	Laplace transform: Unit Step Function - Second Shifting Theorem - t-shifting - Convolution Theorem
11	Inverse Laplace Transform
12	Applications: Solution of D.E. using Laplace Transform - Solution of integral equation (Volterra Integral Eq.) using Laplace - Transform - 12th week assessment
13	Fourier series: Fourier series for functions of period 2P
14	Fourier series: Fourier series for Even and Odd functions - Fourier series for harmonic functions Fourier series for harmonic functions
15	General Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams		Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20	Midterm	←	1 0 M A R K S To be freely distributed among possible assessments			→	30
8 to 12	←			2 0 M A R K S			→	20
13 to 15	←			1 0 M A R K S			→	10
16 or 17	40	Final						40
Total	Exams		Assign.	Quizzes	Reports	Present.	Lab.	100

REFERENCES

Textbook	Advanced Engineering Mathematics, Fifth Edition 2014, Dennis G.Zill/Warren S.Wright
Other	