

Course Code	EM201
Course Title	Mathematics III
No. of Credits	3
Pre-requisites	
Compulsory/Optional	Compulsory
Aim(s): To provide the students with theoretical as well as computational knowledge regarding linear ordinary differential equations. To introduce basic concepts of probability and usage of them in engineering applications.	
Intended Learning Outcomes: On successful completion of the course, the students should be able to;	
<ul style="list-style-type: none"> • Identify/derive the mathematical models of many physical problems as differential equations. • Solve first order separable, linear and exact differential equations and reducible forms • Solve higher order linear ordinary differential equations analytically using D-operators, Method of Undetermined coefficients and Laplace transformations and analyze the solution of such second order equations • Apply matrix methods and Laplace transform in solving systems of linear systems of ordinary differential equations. • Explain basic concepts of probability, define discrete and continuous random variables and calculate associated probabilities for a given real life problem 	
Time Allocation (Hours): Lectures 36 Tutorials 9 Practicals Assignments	
Course content/Course description:	
<ul style="list-style-type: none"> • Introduction: Differential Equations as a mathematical model and Classification • First order ordinary Equations: Separable, Linear, Exact, Reducible forms • Higher order ordinary linear equations with constant coefficients: D-operators, undetermined coefficients; bracket method; Solution behaviors. • Linear Systems: Eigenvalue and eigenvector method; Introduction to Phase Plane; Decoupling; Matrix exponential method • Laplace Transforms: Laplace transform of functions and derivatives; Solving ordinary differential equations and linear systems; Convolution • Concepts of probability: Random variables, Probability functions, Mathematical expectation, Moment generating functions. • Discrete and continuous probability distributions: Bernoulli (Point binomial) Distribution, Binomial distribution, Poisson distribution, Exponential distribution, Normal distribution 	
Recommended Texts :	
<ul style="list-style-type: none"> • R.K. Nagle, E.W. Saff, A.D. Snider. Fundamentals of Differential Equations, 8th edition, Pearson Education • Advanced Engineering Mathematics - E. Kreyszig • D.C. Montgomery and G.C. Runger (2013). Applied Statistics and Probability for Engineers. 6th Edition, John Wiley and Sons, Inc. 	
Assessment	Percentage Mark
In-course	
Tutorials	10
Mid Semester Examination	30
End-semester	60