

F.E. FIRST SEMESTERCourse Code – **210101****Course Name:** Engineering Mathematics I

Credit Points : 4	Teaching Hrs/Week	Tutorials / week
	3 Hrs/Week	1 Hr / Week

Objective	To impart Fundamental knowledge of Mathematics and its tools . To Develop the skills of Mathematics amongst the Engineering Students and ‘enhance ‘their ‘‘Thinking Power’’
Prerequisites	Fundamental knowledge of Calculus ,Algebra, Trigonometry, and Geometry.

Unit	Topic Name	Details	Hrs
0	Preliminaries	Complex Numbers, DeMoivre’s Theorem, Hyperbolic Functions, Binomial theorem, Permutations & Combinations, St. Lines, Circles, Conic Sections, Vectors, Matrices, Determinants	5
1	Differential Calculus	Successive Differentiation, Leibnitz’s theorem, Mean Value Theorem, Taylor’s Theorem, Maclaurin’s expansions, Indeterminate Terms, L’Hospital’s Rule, Partial Differentiation, Euler’s Theorem on Homogeneous functions, Maxima and minima of functions of two variable, Curve Tracing	16
2	Integral Calculus	Integration as a limit of a sum, Rectification, Surface area of revolution, only theory of finding Area, volume using single integrals [Problems on these topics be done through double, multiple integrals in II semester], Trapezoidal Rule, Simpson’s one third Rule	6
3	Differential Equations	Formation of DE, First Order DE, Variable Separable form, Homogeneous DE, Non homogeneous DE, Linear DE, Bernoulli’s DE, Exact DE	8
4	Matrices	Inverse of a Matrix, Elementary Transforms, Normal Form of a Matrix, Rank of a Matrix (using Normal form only), Eigen Values, Eigen Vectors, Cayley Hamilton’s Theorem, Inverse of a Matrix using Cayley Hamilton’s theorem	7
5	Sequences and Series	Sequences, Bounded sequences, Convergence of sequences, Cauchy’s sequences, Complete space, Infinite Series- Cauchy’s n^{th} root test, P series, Comparison test, D’Alembert’s ratio test, Raabe’s test.	8

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Text Books	<ol style="list-style-type: none"> 1) TM Apostol : Calculus, Vol I & II 2) Kreyszig : Advanced Engineering Mathematics 3) SM Pilley & Narainana Calculus Vol I & II
Reference Books	<ol style="list-style-type: none"> 1) BS Grewal : Higher Engineering Mathematics 2) W Rudin : Principles of Mathematical analysis 3) GB Thomas & Finney : Calculus & Analytical Geometry
Related Websites	<ol style="list-style-type: none"> 1. www.enm.bris.ac.uk 2. libguides.library.dal.ca/content.php?pid=1078&sid=67322 3. www.intute.ac.uk/sciences/mathematics

Examination Scheme	Assignments, Seminars and	
	Internal Assessment	40 Marks
	Final Theory Paper	Written : 60 Marks