SHORT SYLLABUS

BMAT101L Calculus

3 Credits (3-0-0)

Limits and Continuity of Single Variable Functions- Differentiation- Rolle's Theorem and The Mean Value Theorem- Maxima and Minima. Integration- Area between Curves - Volumes of Solids Of Revolution. Functions of Two Variables-Limits and Continuity-Partial Derivatives –Total Differential-Jacobian. Taylor's Expansion For two Variables – Maxima and Minima - Lagrange's Multiplier Method. Evaluation Of Double Integrals— Change of Order of Integration -Change of Variables -Evaluation of Triple Integrals-Beta And Gamma Functions-Error Functions Complementary Error Functions. Scalar and Vector Valued Functions — Gradient, Tangent Plane—Directional Derivative-Divergence and Curl—Scalar and Vector Potentials. Line, Surface and Volume Integrals - Statement of Green's, Stoke's and Gauss Divergence Theorems.

BMAT101L	Calculus	L	TF	C				
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Pre-requisite	Nil	Syllabus version						
Course Object	lvoc		1.0					
		and the	other					
1. To provide the requisite and relevant background necessary to understand the other								
important engineering mathematics courses offered for Engineers and Scientists.								
2. To introduce important topics of applied mathematics, namely Single and Multivariable Calculus and Vector Calculus etc.								
		matical r	roblen	ne				
3. Enhance to use technology to model the physical situations into mathematical problems, experiment, interpret results, and verify conclusions.								
Course Outcor	•							
At the end of the course the student should be able to:								
Apply single variable differentiation and integration to solve applied problems in								
engineering and find the maxima and minima of functions								
2. Evaluate partial derivatives, limits, total differentials, Jacobians, Taylor series and								
optimization problems involving several variables with or without constraints								
3. Evaluate multiple integrals in Cartesian, Polar, Cylindrical and Spherical coordinates.								
4. Use special functions to evaluate various types of integrals.								
5. Understand gradient, directional derivatives, divergence, curl, Green's, Stokes and Gauss								
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Beta and Gamma functions-interrelation between beta and gamma functions-evaluation of multiple integrals using gamma and beta functions. Dirichlet's integral -Error functions complementary error functions.

Module:6 | Vector Differentiation

5 hours

Scalar and vector valued functions - gradient, tangent plane-directional derivativedivergence and curl-scalar and vector potentials. Statement of vector identities-simple problems.

Module:7 Vector Integration

Line, surface and volume integrals - Statement of Green's, Stoke's and Gauss divergence theorems -verification and evaluation of vector integrals using them.

Module:8 Contemporary Topics

2 hours

Guest lectures from Industry and, Research and Development Organizations

Total Lecture hours:

45 hours

Text Book

George B.Thomas, D.Weir and J. Hass, Thomas Calculus, 2014, 13th edition, Pearson

Reference Books							
1.	Erwin Kreyszig, Advanced Engineering Mathematics, 2015, 10th Edition, Wiley India						
2.	B.S. Grewal, Higher Engineering Mathematics, 2020, 44th Edition, Khanna Publishers						
3.	. John Bird, Higher Engineering Mathematics, 2017, 6th Edition, Elsevier Limited.						
4.	James Stewart, Calculus: Early Transcendental, 2017, 8th edition, Cengage Learning.						
5.	K.A.Stroud and Dexter J. Booth, Engineering Mathematics, 2013, 7th Edition, Palgrave						
	Macmillan.						
Mode of Evaluation: CAT, Assignment, Quiz and FAT							
Red	commended by Board of Studies	24.06.2021					
Approved by Academic Council		No. 63	Date	23.09.2021			