

Faculty Name :			Academic Year: 2025-26 (ODD SEMESTER)				
Department: Mathematics FOR EE stream (BMATE301)							
Course Code	Course Title	Core/Elective	Pre-requisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BMATE301	Mathematics III for EE Engineering	Core	Differentiation, Integration, Partial Fraction, Differential Equation	3	2	-	40
Objectives	To acquaint the students with differential equations and their applications in electrical engineering To find the association between attributes and the correlation between two variables Learn to use Fourier series to represent periodical physical phenomena in engineering analysis and to enable the student to express non periodic functions to periodic function using Fourier series and Fourier transforms. To learn the basic ideas of the theory of probability and random signals.						
Topics Covered as per Syllabus							
<p><b>Module-1 :Ordinary Differential Equations of Higher</b> Importance of higher-order ordinary differential equations in Electrical &amp; Electronics Engineering applications. Higher-order linear ODEs with constant coefficients - Inverse differential operator, problems.Linear differential equations with variable Coefficients-Cauchy's and Legendre's differential equations - Problems. Applications:Application of linear differential equations to L-C circuit and L-C-R circuit.</p> <p><b>Module-2: Curve fitting, Correlation and regressions</b> Principles of least squares, Curve fitting by the method of least squares in the form <math>y = a + bx</math> , <math>y = a + bx + cx^2</math> , and <math>y = ax^b</math> . Correlation, Co-efficient of correlation, Lines of regression, Angle between regression lines, standard error of estimate, rank correlation</p> <p><b>Module-3 Fourier series.</b> Periodic functions, Dirchlet's condition, conditions for a Fourier series expansion, Fourier series of functions with period <math>2\pi</math> and with arbitrary period. Half rang Fourier series. Practical harmonic analysis. Application to variation of periodic current.</p> <p><b>Module-4 Fourier transforms and Z -transforms</b> Infinite Fourier transforms: Definition, Fourier sine, and cosine transform. Inverse Fourier transforms Inverse Fourier cosine and sine transforms. Problems. Z-transforms: Definition, Standard z-transforms, Damping, and shifting rules, Problems. Inverse z-transform and applications to solve difference equations</p> <p><b>Module-5 Probability distributions</b> Review of basic probability theory, Random variables-discrete and continuous Probability distribution function, cumulative distribution function, Mathematical Expectation, mean and variance, Binomial, Poisson,Exponential and Normal distribution (without proofs for mean and SD) – Problems. Sampling Theory: Introduction to sampling distributions, standard error, Type-I and Type-II errors.Student's t-distribution, Chi-square distribution as a test of goodness of fit.</p>							
List of Text Books							

- 1 B.S.Grewal:“Higher Engineering Mathematics”, Khanna publishers,44thEd.2018
2. E.Kreyszig:“AdvancedEngineeringMathematics”,JohnWiley&Sons,10thEd.(Reprint),2016.

### List of Reference Books

- 1.V.Ramana:“HigherEngineeringMathematics”McGraw-HillEducation,11thEd.
- 2.SrimantaPal&SubodhC.Bhunia:“EngineeringMathematics”OxfordUniversity Press, 3rdReprint, 2016.
3. N.P Bali and Manish Goyal: “A textbook of Engineering Mathematics” Laxmi Publications, Latest edition.
4. C. Ray Wylie, Louis C. Barrett: “Advanced Engineering Mathematics” McGraw – Hill Book Co. Newyork, Latested.
5. Gupta C.B, Sing S.R and Mukesh Kumar: “Engineering Mathematic for Semester I and II”, Mc- Graw Hill Education(India) Pvt. Ltd2015.
- 6.K.DassandEr.RajnishVerma:“HigherEngineeringMathematics”S.Chand Publication (2014).
7. JamesStewart:“Calculus”Cengagepublications,7thedition,4thReprint2019.

### List of URLs, Text Books, Notes, Multimedia Content, etc

- <http://nptel.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
  - <http://academicearth.org/>
  - VTU e-Shikshana Program

<b>Course Outcomes</b>	<p><b>Course Outcomes:</b>  <b>Course outcome (Course Skill Set)</b>            At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> <li>1. Understand that physical systems can be described by differential equations and solve such equations</li> <li>2. Make use of correlation and regression analysis to fit a suitable mathematical model for statistical data</li> <li>3. Demonstrate the Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing, and field theory.</li> <li>4. To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations</li> <li>5. Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field. Demonstrate the validity of testing the hypothesis.</li> </ol>
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**Internal Assessment Marks: For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.**

### The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	BMATE301	TITLE Mathematics III for EE Engineering						Faculty Name:					
List of Course Outcomes	Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO-1	3	2	-	-	-	-	-	-	-	-	-	1	
CO-2	2	2	-	-	-	-	-	-	-	-	-	1	
CO-3	3	2	-	-	-	-	-	-	-	-	-	-	
CO-4	3	2	-	-	-	-	-	-	-	-	-	2	
CO-5	2	2	-	-	-	-	-	-	-	-	-	-	

**Note:** 3 = Strong Contribution    2 = Average Contribution    1 = Weak Contribution