

COURSE MODULE OF THE SUBJECT TAUGHT FOR ODD SEMESTER 2023-2024

Course Syllabi with CO's

EEE

Faculty Name :			Academic Year: 2023-24 (ODD SEMESTER)				
Department: Mathematics							
Course Code	Course Title	Core/ Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BMATE 301	Mathematics-III for EE Engineering	Core	Differentiation, Integration, Partial Fraction, Differential Equation	3	1	-	-40
Objectives	<ul style="list-style-type: none"> 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							
Module-1 :Ordinary Differential Equations of Higher Importance of higher-order ordinary differential equations in Electrical & 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.							
Module-2: Curve fitting, Correlation and regressions Principles of least squares, Curve fitting by the method of least squares in the form $y = a + bx$, $y = a + bx + cx^2$, and $y = ax^b$. Correlation, Co-efficient of correlation, Lines of regression, Angle between regression lines, standard error of estimate, rank correlation							
Module-3 Fourier series. Periodic functions, Dirchlet's condition, conditions for a Fourier series expansion, Fourier series of functions with period 2π and with arbitrary period. Half rang Fourier series. Practical harmonic analysis. Application to variation of periodic current.							
Module-4 Fourier transforms and Z -transforms 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							



Module-5 Probability distributions

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.

Title of the Book Name of the Author/s Name of the Publisher Edition and Year

Textbooks

- 1 B.S.Grewal: "Higher Engineering Mathematics", Khanna publishers, 44th Ed. 2018
2. E.Kreyszig: "Advanced Engineering Mathematics", John Wiley & Sons, 10th Ed. (Reprint), 2016.

List of Reference Books

1. V. Ramana: "Higher Engineering Mathematics" McGraw-Hill Education, 11th Ed.
2. Srimanta Pal & Subodh C. Bhunia: "Engineering Mathematics" Oxford University Press, 3rd Reprint, 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. New York, Latested.
5. Gupta C.B, Sing S.R and Mukesh Kumar: "Engineering Mathematic for Semester I and II", Mc- Graw Hill Education (India) Pvt. Ltd 2015.
6. H.K. Dass and Er. Rajnish Verma: "Higher Engineering Mathematics" S. Chand Publication (2014).
7. James Stewart: "Calculus" Cengage publications, 7th edition, 4th Reprint 2019.

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

- <http://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/>
- <http://www.bookstreet.in>
- VTU e-Shikshana Program
- VTU EDUSAT Program

Course Outcomes

On completion of this course, students are able to:

CO1: Understand that physical systems can be described by differential equations and solve such equations.

CO2: Make use of correlation and regression analysis to fit a suitable mathematical model for statistical data.

CO3: Demonstrate the Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing, and field theory.

CO4: To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations.

CO5: Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field. Demonstrate the validity of testing the hypothesis.

Internal Assessment Marks: 50 (25 marks for the CIE's Assignment component and 25 for the Internal Assessment Test component).



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

Course Code: BMATE 301	Course: Mathematics-III for EE Engineering												Faculty Name:	
List of Course Outcomes	Program Outcomes												PSO	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO-1	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO-2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-3	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO-4	3	2	-	-	-	-	-	-	-	-	-	2	-	-
CO-5	2	2	-	-	-	-	-	-	-	-	-	-	-	-

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