SHARNBASVA UNIVERSITY, KALABURAGI

ENGINEERING MATHEMATICS-III

(Common to all branches)

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2019-20)

Course Code : 18MAT31
Contact Hours/Week : 04
Total Hours:50
Semester : III

CIE Marks : 50
SEE Marks: 50
Exam Hours:03
Credits: 04

Course Learning Objectives:

This course will enable students to:

- Introduce most commonly used analytical and numerical methods in the different engineering fields.
- Learn Laplace transform and Z-transforms, statistical methods, numerical methods.
- Solve the problem on Interpolation.
- To discuss the random variable and associated probability distributions.

MODULE-I

LAPLACE TRANSFORMS : Definition Transforms of Elementary functions, properties of periodic function, Unit step function, Unit impulse function.

INVERSE LAPLACE TRANSFORMS : Definition, Convolution Theorem(without proof), Finding Inverse Laplace transform by convolution Theorem. Solution of Linear Differential equations using Laplace Transforms and Applications(5 Assignment Problem).

MODULE-II

Z- TRANSFORMS: Difference Equations ,Basic definitions, Damping rule, Shifting rule, Initial and Final Value theorems(without proof) and problems. Inverse Z-transforms. Applications of Z-transforms to solve difference equation(5 Assignment Problem).

MODULE-III

STATISTICAL METHODS: Correlation-karl Pearson's co-efficient of correlation problems. Regression analysis lines of regression (without proof)-problems.

CURVE FITTING: Curve fitting by the method of least square. Fitting of the curves of the form $y = ax + b, y = ax^2 + bx + c$ & $y = ae^{bx}$.

Numerical Methods: Numerical solution of algebraic and transcendental equations by Regula - Falsi Method and Newton-Raphson method. (5 Assignment Problem).

MODULE-IV

FINITE DIFFERENCE: Forward and Backward differences, Newton's forward and backward interpolation formulae. Divided difference-Newton's divided difference formulae. Lagrange's-interpolation formula and inverse interpolation formula(all formula without proof) problems.

Dr S. S. Patil

Mahantesh Swamy.

(Dr. Suresh)

Kabbeth
Dr. Swati Kabbeth

Swami
(Sharanayya Swami)

(Dr Sharanagouda Malpatil)

Dr. Ashok patil

(Dr G. Jayaraksha Reddy)

NUMERICAL INTEGRATION: Simpsons $(\frac{1}{3})^{rd}$, $(\frac{3}{8})^{th}$ rules, Weddle's rule (without proof) problems. (5 Assignment Problem).

MODULE-V

Probability Distribution: Random variables(discrete and continuous) probability mass/density functions. Binomial distribution, Poisson distribution. Exponential and Normal distributions. Problems. (5 Assignment Problem).

Course outcomes: On completion of this course, students are able to:

- Know the use of Laplace transform and inverse Laplace transform in signal and image processing.
- Explain the general linear system theory for continuous time signals and digital signal processing using the Z-transform.
- Employ appropriate numerical methods to solve algebraic and transcendental equations.
- Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various application in the field of electro-magnetic and gravitational fields and fluid flow problems.

Question paper pattern:

- The question paper will have ten questions.
- Each full Question consisting of 16 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:

1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 43rd Ed., 2015.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons,10th Ed., 2015.

Reference Books:

1. N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, 7th Ed., 2010.
2. B.V.Ramana: "Higher Engineering Mathematics" Tata McGraw-Hill, 2006.
3. H. K. Dass and Er. Rajnish Verma: "Higher Engineering Mathematics", S. Chand publishing, 1st edition, 2011.

Web Link and Video Lectures:

1. *http://nptel.ac.in/courses.php?disciplineID=111*
2. *http://www.khanacademy.org/*
3. *http://www.class-central.com/subject/math*

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