19HS201 ENGINEERING MATHEMATICS-III

Hours Per Week :

L	T	P	C
2	0	2	3

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
30	-	30	-	-	-	-	-	-

COURSE DESCRIPTION AND OBJECTIVES:

Testing of hypothesis in statistics is necessary in doing the project analysis and research methodology. Numerical methods are very useful in agricultural related subjects.

COURSE OUTCOMES:

Upon completion of the course, student will able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand the concept of partial differential equation.	---
2	Analyse solution techniques by Bessel's and Legendre's differential equations.	2
3	Apply functions of complex variable by cauchy-riemann equation and harmonic function.	3
4	Evaluate Cartesian and polar coordinates to find area.	4
5	Apply t-test, F-test, chi square test in various software.	5
6	Apply laplace transformation to ordinary and differential equation.	3

SKILLS:

- ✓ *Solve various methodsV to partial differential equation.*
- ✓ *Solve Bessel's and Legendre's differential equations.*
- ✓ *Compute laplace transformation.*
- ✓ *Compute testing of hypothesis.*

UNIT - I   **L-6**

Partial differential equations: Elimination of one and two arbitrary function, Formation of partial differential equations, Higher order linear partial differential equations with constant coefficients, application of partial differential equations (one dimensional wave and heat flow equations, Laplace Equation.

UNIT - II   **L-6**

Series solution techniques: Bessel's and Legendre's differential equations.

UNIT - III   **L-6**

Functions of a Complex variable: Limit,continuity and analytic function, Cauchy-Riemann equations, Harmonic functions.

UNIT - IV   **L-6**

Laplace transformation: Laplace transformation and its applications to the solutions of ordinary and simultaneous differential equations.

UNIT - V   **L-6**

Testing of Hypothesis: Level of Significance-Degrees of freedom-Statistical errors, Large sample test (Z-test),Small sample test t-test (One tailed, two tailed and Paired tests), (ONLY MEANS) Testing of Significance through variance (F-test), Chi-Square test, contingency table, Correlation, Regression.

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS   **TOTAL HOURS: 30**

1. Partial differential equations.
2. Applications of partial differential equations.
3. Series solutions of differential equations.
4. Bessel's differential equations.
5. Legendre's differential equations.
6. Analytical functions, Cauchey-Riemann equations.
7. Harmonic functions.
8. Laplace transformation.
9. application of Laplace transformations to solutions of ordinary.
10. Problems on one Sample, two sample Z-tests when population S.D. is known.
11. Problems on one Sample, two sample Z-tests when population S.D. is unknown.
12. Problems on one sample using t-test.
13. Problems on two sample and paired t-test.
14. Contingency table and Chi-Square test - 2x2 and m x n.
15. F-test.
16. Calculation of correlation coefficient and its testing.
17. Practical exmaination.

TEXT BOOKS :

1. H. K. Dass and RajanishVerma, 2015, "Higher Engineering Mathematics", S. Chand & Co., 3rd edition.
2. B. S. Grewal, 2018, "Higher Engineering Mathematics", Khanna Publishers, 44th edition.

REFERENCE BOOKS:

1. John Bird, 2018, "Higher Engineering Mathematics", Routledge (Taylor & Francis Group), London, New York.
2. Srimanta Pal, Subodh C. Bhunia, 2015, "Engineering Mathematics", Oxford Publications.
3. B. V. Ramana, "Advanced Engineering Mathematics", TMH Publishers.
4. N. P. Bali, K. L. Sai Prasad, 2018, "A Textbook of Engineering Mathematics I, II and III",Universal Science Press, New Delhi.
5. T. K.V. Iyengar 2018, "Engineering Mathematics, I, II, III", S. Chand & Co., New Delhi.
6. Narayan Shanti. 2004, "Differential Calculus". S. Chand and Co. Ltd. New Delhi.