Course Curriculam

Course Code: MATH242

Course Level UG

Course Title Applied Mathematics-IV

Course Description :

Credit Units

L	T	P/S	SW	AS/DS	FW	No. of PSDA	Total Credit Unit
3	0	0	2	0	0	0	4

Course Objectives :

SN.	Objectives
1	By the end of the semester, students will be able to deals with the techniques of numerical analysis which gives the solution to applied problem when ordinary analytical method fails. Also, students get acquainted with the all the basic concepts of statistics which will help them in various disciplines in coming semesters. The applications of this course includes business and engineering problems involving probability, probability distribution and curve fitting.

Pre-Requisites : General

SN.	Course Code	Course Name

Course Contents / Syllabus :

SN.	Module	Descriptors / Topics	Weightage
1	Module I: Iterative Techniques and Interpolation	• Bisection Method, • Method of False Position, • Newton-Raphson method • Jacobi iteration method, • Gauss Seidal method • Finite Differences, • Difference tables • Polynomial Interpolation: Newton's forward and backward formula • Central Difference Formulae: Gauss forward and backward formula. • Interpolation with unequal intervals: Lagrange's Interpolation, • Newton Divided difference formula .	40.00
2	Module II: Numerical Differentiation and Integration	• Introduction • Numerical differentiation • Numerical Integration : Trapezoidal rule, Simpson's 1/3 and 3/8 rules, • Solution of differential equations: Euler's Method, • Runga-Kutta 4th Order Method	30.00
3	Module III: Probability and Probability Distributions	• Overview of Probability • Introduction and expected value of Random variable (discrete and continuous), Variance of Random Variable • Probability Distribution: Binomial, Poisson, Normal	15.00
4	Module IV: Dispersion, Curve fitting and Principle of least square	• Moments about a point, mean and origin • Skewness, Kurtosis Pearson's ß and ? – coefficients • Curve Fitting using Method of Least Squares • Fitting of Straight lines • Fitting of second degree parabola	15.00

Course Learning Outcomes :

SN.	Course Learning Outcomes
1	Students will be able to analyze and solve various concepts related to probability and probability distributions like binomial, poisson and normal distributions.
2	Students will be able to fit various curves of the form of straight line, parabola with the help of least square method.
3	Students will be able to apply iterative methods to solve the simultaneous equations and algebraic equations.

4	Students will be able to solve transcendental equations using numerical methods.
5	Students will be able to form a polynomial/curve satisfying the given data when the intervals are equally/unequally spaced using different numerical methods.
6	Students will be able to find the value of first derivative and higher order derivatives from the given data even when function is not given.
7	Students will be able to apply concept of numerical methods to solve the differential equations and integrations.

Pedagogy for Course Delivery :

SN.	Pedagogy Methods
1	The course pedagogy will include four quadrant approach i.e. video lectures, presentations, e-content, discussions and assessments.
2	All the topics covered in the syllabus will be correlated with its applications in real life situations and also in other disciplines.
3	In order to inculcate problem solving ability in students' time to time quiz, viva, home assignments and class tests will be conducted during the progress of the semester.
4	Extra sessions for revision will be undertaken.

Theory /VAC / Architecture Assessment (L,T & Self Work): 100.00 Max : 100

Attendance+CE+EE : 5+35+60

SN.	Type	Component Name	Marks
1	Attendance		5.00
2	End Term Examination (OMR)		60.00
3	Internal	MID TERM EXAM	10.00
4	Internal	HOME ASSIGNMENT	10.00
5	Internal	VIVA VOCE	5.00
6	Internal	CLASS QUIZ	5.00
7	Internal	CLASS TEST	5.00

Lab/ Practical/ Studio/Arch. Studio/ Field Work Assessment : 0.00 Max : 100

N/A

List of Professional skill development activities :

No.of PSDA : 0

SN.	PSDA Point

Text & References :

SN.	Type	Title/Name	Description	ISBN/ URL
1	Book	Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int		
2	Book	S C Gupta and V K Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons.		

3	Book	Grewal B S, “Numerical methods in Engineering and Science”, Khanna Publishers, Delhi.		
4	Book	Gerald & Whealey, “Applied Numerical Analyses”, AW.		
5	Book	Rohatgi, V.K. and Saleh, A.K. Md. E. (2009):An Introduction to Probability and Statistics, 2nd Edn.		John Wiley and Sons.
6	Book	Goon A.M., Gupta M.K. and Dasgupta B. (2005): Fundamentals of Statistics, Vol.I, 8th Edn.World Press		