INSTITUTE	**FACULTY OF COMPUTER APPLICATIONS**
PROGRAM	**BACHELOR OF COMPUTER APPLICATIONS**
SEMESTER	**2**
COURSE TITLE	**MATHEMATICS – 2 (COMPUTER ORIENTED NUMERICAL METHODS)**
COURSE CODE	**05BC3201**
COURSE CREDITS	**3**

Objective:

1 To enable students to understand concept of error handling in these methods and need to analyze and predict it.

2 To able to understand current iterative algorithms to develop efficient solutions in science, engineering, technology, insurance and banking.

3 o enable to obtain an intuitive and working understanding of numerical methods for the basic problems of numerical analysis and gain an experience in the implementation of numerical methods

4 Apply knowledge of differentiation, integration in numerical calculation

5 Understand the application and solution of linear differential equations & predictor –corrector methods.

Course Outcomes: After completion of this course, student will be able to:

1 Apply different type of errors rules occurring in numerical calculation & solution of them.

2 Impart knowledge of numerical iterative methods for the basic problems of numerical analysis

3 Apply algorithmic implementation of different interpolation methods

4 Apply the concept of differentiation, integration in numerical calculation.

5 Understand and apply the application and solution of linear differential equations & predictor –corrector methods.

Pre-requisite of course: Basic knowledge of Functions, Differentiation & Integration.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

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DR. R SRIDARAN
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
1	**FLOATING-POINT ARITHMETIC** Introduction : Floating Point and Error, Truncation & Round Off Errors, Absolute Error, Relative Error, Addition of Floating Point Numbers, Subtraction of Floating Point Numbers, Multiplication of Floating Point Numbers, Division of Floating Point Numbers	10
2	**ITERATIVE METHODS FOR FINDING ROOTS** Intermediate Value Theorem, Bisection Method, False Position Method, Secant Method, Method of Successive Approximation	10
3	**INTERPOLATION** Idea of Interpolation, Lagrange Interpolation, Inverse Lagrangian Interpolation, Newton's Forward Differences Interpolation, Newton's Backward Differences Interpolation, Newton's Divided Differences Interpolation	10
4	**NUMERICAL DIFFERENTIATIONAL & INTEGRATION** Introduction to Calculus, Newton's Forward Differences Differentiation, Newton's Backward Differences Differentiation, Newton's Divided Difference Differentiation (1st order only), Trapezoidal Rule, Simpson's 1/ 3 rule, Simpson's 3/8 rule	10
5	**SOLUTION OF SIMULATANEOUS LINEAR & DIFFERENTIAL EQUATIONS** Gauss Elimination Method, Gauss Jordan Method, Gauss Seidel Method, Runge Kutta 2nd Order Method, Runge Kutta 4th Order Method, Milne - Simpson's Method, Adams - Multon's Method	10
Total Hours		**50**

Textbook :

1 Computer Oriented Numerical Methods, R. S. Salaria, Khanna Publisher, -

References:

1 Numerical Methods with Programs in C", Numerical Methods with Programs in C", T Veerarajan, T Ramachandran,, Tata McGraw Hill Publication, 2ND

2 "Numerical Methods",, "Numerical Methods",, V. Rajaraman, Prentice-Hall India Pvt. Ltd., 3RD

3 Numerical Methods with C++Programming", , Numerical Methods with C+ +Programming", , R M Somasundaram, R M Chandrasekaran, Prentice-Hall India Pvt. Ltd, 3RD

4 Applied Numerical Analysis", Applied Numerical Analysis", C F Gerald, P O Wheatley, Pearson Education Asia, New Delhi, 7TH

5 "Elementary Numerical Analysis", "Elementary Numerical Analysis", Atkinson, Han, iley India Edition, -

6 "Numerical Methods", "Numerical Methods", DR. V N VEDAMURTHY , Dr. N. Ch. S N Iyengar, VIKAS PUBLICATION, -

7 Numerical Analysis, Numerical Analysis, Richard L Burden, J Douglas Faires, Cengage Publication, -

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References:

8 Numerical Methods, Numerical Methods, Srimanta Pal, Oxford University Press, -

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	

Instructional Method:

1 PRESENTATION

2 BOARD WORK

Supplementary Resources:

1 https://nptel.ac.in/courses/122106033

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