



DEPARTMENT OF MATHEMATICS

COURSE PLAN			
Name of the programme and specialization	M.Sc. MATHEMATICS		
Course Title	Numerical Analysis		
Course Code	MA710	No. of Credits	03
Course Code of Pre-requisite subject(s)	NIL		
Session	Jan 2021	Section (if, applicable)	-
Name of Faculty	Dr. K. Murugesan	Department	Mathematics
Email	murugu@nitt.edu	Telephone No.	9443785050
Name of Course Coordinator(s) (if, applicable)	-		
E-mail	-	Telephone No.	-
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
SYLLABUS (APPROVED IN BOS)			
<p>Linear Systems of Equations- Direct Methods-Gauss Jordan Elimination Method – Triangularization method – Cholesky method – Error Analysis - Iteration Methods - Jacobi iteration method – Gauss - Seidal iteration method – Eigen Value Problems: power method</p> <p>Transcendental and polynomial equations-linear interpolation method-Mullar’s method, Newton’s method for non-linear system. Root squaring method, Bairstow method.</p> <p>Interpolation and Approximation: Interpolating polynomials, divided Differences-Spline curves. Least-Square approximation.</p> <p>Numerical differentiation and integration-open and closed type formulae.</p> <p>Numerical solution of ordinary differential equation- single and multi-step methods for IVP. Stability analysis.</p>			
ESSENTIAL READINGS : (Textbooks, reference books etc.)			
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. David Kinciad & Ward Cheney, Numerical Analysis and mathematics of scientific computing, Brooks/Cole, 1999 2. K. Atkinson, Elementary Numerical Analysis, Jhon Wiley & Sons, 2004 3. Curtis E Gerald &Partrock O Whealtley, Applied Numerical Analysis, Pearson edu. 2004 4.M.K.Jain, S.R.K.Iyengar, R.K.Jain, NuericalMethodd:For Scientific and Engineering Computation, New Age International, 7thedn, 2019 5. John H. Mathews, Kurtis K. Fink, Nuerical Methods Using Matlab, 4thEdn, Pearson, 2004 			



COURSE OUTCOMES (CO)			
Course Outcomes			Aligned Programme Outcomes (PO)
On completion of this course students will be able to			
1.	Find the numerical solution of the linear system of equations $AX=b$	(i) progress the critical analysis and problem solving skills required for R & D organization and industry. (ii) engage independent and lifelong learning with a high level of enthusiasm and commitment to improve knowledge and competence continuously. (iii) contribute significantly in academics through teaching and research.	
2.	Find the roots of transcendental and polynomial equations		
3.	Approximate the function and interpolate function and its derivatives		
4.	Find numerical differentiation of the function and the numerical solution of ordinary differential equation.		
5.	Find the single and double integral numerically.		
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	1 st , 2 nd & 3 rd week	Linear Systems of Equations- Direct Methods- Gauss Jordan Elimination Method – Triangularization method – Cholesky method – Error Analysis - Iteration Methods - Jacobi iteration method – Gauss - Seidal iteration method – Eigen Value Problems: power method	On-line mode
2.	4 th , 5 th & 6 th week	Transcendental and polynomial equations- linear interpolation method-Mullar’s method, Newton’s method for non-linear system. Root squaring method, Bairstow method.	On-line mode
3.	7 th Week	Assessment - 1	



4.	7 th & 8 th week	Interpolation and Approximation: Interpolating polynomials, divided Differences-Spline curves. Least-Square approximation.	On-line mode
5.	9 th , 10 th & 11 th week	Numerical differentiation and integration- open and closed type formulae.	On-line mode
6.	12 th Week	Assessment - 2	
7.	13 th week	Compensation Assessment	
7.	13 th & 14 th Week	Numerical solution of ordinary differential equation- single and multi-step methods for IVP. Stability analysis.	On-line mode
8.	After 14 th Week	Assessment-4 (End Semester Exam)	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week / Date	Duration	% Weightage
1.	Assessment - 1	7th Week	1 $\frac{1}{2}$ hour	25%
2.	Assessment - 2	12 th Week	1 $\frac{1}{2}$ hour	25%
3.	(Assignment/Seminar) Assessment - 3	6 th week and 12 th week	-	20%
4.	Compensation Assessment	13 th Week	1 $\frac{1}{2}$ hour	25%
5.	Assessment-4 (End Semester Exam)	after 14 th Week	3 hours	30%

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Students can meet the faculty (with prior appointment) at any stage in the course duration in case he/she finds difficulty in understanding the topic.
2. Feedback form will be issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course.
3. Student knowledge about the topic covered in this course will be judged through marks obtained in examination.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email / phone etc)

Students can meet the course faculty by fixing appointment through E-mail (murugu@nitt.edu) between 9:30 am to 5:30 pm from Monday to Friday.



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COMPENSATION ASSESSMENT POLICY

1. Students who have missed the assessment-1 or assessment-2 or both can register for compensatory assessment which shall be conducted soon after the completion of the assessment 2 and before the regular semester examination. Other students were strictly NOT allowed to register for compensation assessment.
2. The compensation assessment shall be conducted for 25 marks comprising the syllabus of both assessment 1 and assessment 2.
3. Students should submit assignments before last date of submission. In case students fail to submit their assignments, he/she will get zero mark for that particular assignment.
4. The Institute follows relative grading with flexibility given to class committee to decide the mark ranges for grades. All assessment of a course will be done on the basis of marks.
5. There will be one Reassessment for the students who have secured "F" in this course and will be conducted within a month from reopening of institute for next semester. Students should register their names with course teacher to appear for reassessment within three days from reopening of institute for next semester.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM


- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office
The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION: -

FOR APPROVAL:


25/01/2021
Dr. K. MURUGESAN
Course Faculty


25/1/2021
Dr. P. SAIKRISNAN
CC-Chairperson


Dr. V.L. Gomathi Nayagam
HOD