NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF MATHEMATICS

COURSE PLAN – PART I			
Name of the programme and specialization	**B.TECH, MATHEMATICS - I**		
Course Title	MATRICES AND CALCULUS		
Course Code	**MAIR11**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**NIL**		
Session	**August 2023**	**Section (if, applicable)**	**A**
Name of Faculty	**DR. V. SHANTHI**	**Department**	**MATHEMATICS**
Official Email	**vshanthi@nitt.edu**	**Telephone No.**	**9487440341**
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		**Telephone No.**	**04312503673**
Course Type (please tick appropriately**)**	√ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem. Quadratic form.

Sequence and series: Convergence of sequence. Infinite Series-Tests for Convergence-Integral test, comparison test, Ratio test, Root test, Raabe's test, Logarithmic test, and Leibnitz's test; Power series.

Functionsoftwovariables:Limit,continuityandpartialderivatives;Total derivative, Jacobian, Taylor series, Maxima, minima and saddle points; Method of Lagrange multipliers;

Double and triple integrals, change of variables, multiple integral in cylindrical and spherical coordinates.

Gradient,divergenceandcurl;Lineandsurfaceintegrals;Green'stheorem ,Stokestheoremand Gauss divergence theorem (withoutproofs)

COURSE OBJECTIVES

*Introduce eigen value and eigen vectors and its properties.
•Determine canonical form of given quadratic form.
•Discuss the convergence of infinite series.
•Analyze and discuss the extrema of the functions of several variables.
•Evaluate the multiple integrals and apply in solving problems.
•Introduce vector differential operator for vector function and important theorems on vector functions to solve engineering problems

MAPPING OF COs with POs

Course Outcomes	**Programme Outcomes (PO)** (Enter Numbers only)
1. Compute eigenvalues and eigenvectors of the given matrix.	**1**
2. Transform given quadratic form into canonical form.	**1,6**
3. Discuss the convergence of infinite series by applying various test	**1**
4. Compute partial derivatives of function of several variables	**1,6**
5. Write taylor's series for functions with two variables.	**1,6**
6. Evaluate multiple integral and its applications in finding area, volume.	**1,6**
7. Compute the dot product of vectors, lengths of vectors, and angles between vectors.	**1**
8. Perform gradient,div,curl operator on vector functions and give physical interpretations..	**1**
9. Use green's, gauss divergence and stoke's theorems to solve engineering problems	**1**

COURSE PLAN – PART II

COURSE OVERVIEW

COURSE TEACHING AND LEARNING ACTIVITIES			**(** Add more rows)
S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	1 to 3rd weeks 10 hrs	Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem. Quadratic form.	Online MSTeams
2	3rd to 5th week 8hrs	Sequence and series: Convergence of sequence. Infinite Series-Tests for Convergence-Integral test, comparison test, Ratio test, Root test, Raabe's test, Logarithmic test, and Leibnitz's test; Power series	-do-
3	5th to 7th week 8 hrs	Functionsoftwovariables:Limit,continuityandpartialderivatives;Total derivative, Jacobian, Taylor series, Maxima, minima and saddle points; Method of	-do-

		Lagrange multipliers;	
4	7th to 9th week 10 hrs	Double and triple integrals, change of variables, multiple integral in cylindrical and spherical coordinates.	-do-
5	10th to 12th week 8 hrs	Gradient,divergence and curl;Line and surface integrals; Green's theorem, Stokes theorem and Gauss divergence theorem (withoutproofs)	-do-

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assesment 1	5th week	1.15hrs	25marks
2	Assignment1	5th week		10marks
3	Assesment 2	11th week	1.15hrs	25 marks
4	Assignment	11th week		10 marks
CPA	Compensation Assessment*	12th week	1.15hrs	25 marks
5	Final Assessment *	12th week	2 hrs	30 marks

***mandatory; refer to guidelines on page 4**

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

COURSE POLICY (including compensation assessment to be specified**)**

Those who are missed their both or any one of the 1st or 2nd assessment with valid reason only will consider for Compensation assement.

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.

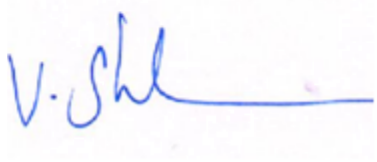
ACADEMIC DISHONESTY & PLAGIARISM

- 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, IF ANY

Students can contact me through whatsapp or by mail before 9.P.Mm after 9. A.M except on Sundays. vshanthi@nitt.edu, Btechproduction2022@gmail.com, 9487440341

FOR APPROVAL



course faculty

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Dr. V. SHANTHI

_____ **CC- Chairperson** _____ **HOD**

Dr.K.PANNEERSELVAM (Dr. C. Sathiya Narayanan)

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.