

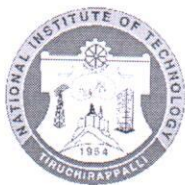


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**NATIONAL INSTITUTE OF TECHNOLOGY,  
TIRUCHIRAPPALLI**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	<b>MATHEMATICS -1</b>		
<b>Course Title</b>	Linear Algebra and Calculus		
<b>Course Code</b>	<b>MAIR-11</b>	<b>No. of Credits</b>	<b>3</b>
<b>Course Code of Pre-requisite subject(s)</b>			
<b>Session</b>	<b>JULY 2019</b>	<b>Section (if, applicable)</b>	<b>B</b>
<b>Name of Faculty</b>	<b>DR. V. SHANTHI</b>	<b>Department</b>	<b>MATHEMATICS</b>
<b>Official Email</b>	<b>vshanthi@nitt.edu</b>	<b>Telephone No.</b>	<b>0431-2503673 9487440341</b>
<b>Name of Course Coordinator(s) (if, applicable)</b>			
<b>Official E-mail</b>		<b>Telephone No.</b>	
<b>Course Type (please tick appropriately)</b>	<input checked="" type="checkbox"/> <b>Core course</b>	<input type="checkbox"/> <b>Elective course</b>	
<b>Syllabus (approved in BoS)</b>			
<p>Vector space – Subspaces – Linear dependence and independence – Spanning of a subspace– Basis and Dimension. Inner product – Inner product spaces – Orthogonal and orthonormal basis – GramSchmidt orthogonalization process. Linear transformation. Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem. Quadratic form</p> <p>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;</p> <p>Functions of two variables: Limit, continuity and partial derivatives; 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.</p>			
<b>COURSE OBJECTIVES</b>			
: Objective of the course is to			
<ol style="list-style-type: none"> <li>1. Introduce vector space and inner product space and its properties.</li> <li>2. introduce eigen value and eigen vectors and its properties.</li> <li>3. determine canonical form of given quadratic form.</li> <li>4. discuss the convergence of infinite series.</li> </ol>			



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5. analyze and discuss the extrema of the functions of several variables. evaluate the multiple integrals and apply in solving problems.	
<b>MAPPING OF COs with POs</b>	
<b>Course Outcomes</b>	<b>Programme Outcomes (PO)</b> (Enter Numbers only)
<p><b>Course Learning Outcomes:</b> Completion of the course, student will be able to</p> <ol style="list-style-type: none"> <li>1. compute eigenvalues and eigenvectors of the given matrix.</li> <li>2. identify vector space and its basis.</li> <li>3. construct orthonormal basis for a given vector space.</li> <li>4. transform given quadratic form into canonical form.</li> <li>5. discuss the convergence of infinite series by applying various test.</li> <li>6. compute partial derivatives of function of several variables</li> <li>7. write Taylor's series for functions with two variables.</li> <li>8. evaluate multiple integral and its applications in finding area, volume</li> </ol>	

COURSE PLAN – PART II				
COURSE OVERVIEW				
COURSE TEACHING AND LEARNING ACTIVITIES				( Add more rows)
S.No.	Week/Contact Hours	Topic	Mode of Delivery	
1				
COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assesment 1	6 <sup>th</sup> week	1 hr	20
2	Assesment 2	11 <sup>th</sup> week	1 hr	20



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3	Assignment			10
CPA	Compensation Assessment*		1hr	20
6	Final Assessment *		3hrs	50
<b>*mandatory; refer to guidelines on page 4</b>				
<b>COURSE EXIT SURVEY</b> (mention the ways in which the feedback about the course shall be assessed)				
<b>COURSE POLICY</b> (including compensation assessment to be specified)				
S.No.	Week /contact hours	Topic	Mode of delivery	
<u>1</u>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup> and 4 <sup>th</sup> week  11 hrs	Vector space – Subspaces – Linear dependence and independence – Spanning of a subspace– Basis and Dimension. Inner product – Inner product spaces – Orthogonal and orthonormal basis – GramSchmidt orthogonalization process. Linear transformation.	<b>Chalk and talk</b>	
<u>2</u>	5 <sup>th</sup> and 6 <sup>th</sup> week/ 6 hours	Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem. Quadratic form		



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<u>3</u>	7 <sup>th</sup> 8 <sup>th</sup> and 9 <sup>th</sup> week 8 hours	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;	
<u>4.</u>	10 <sup>th</sup> , 11 <sup>th</sup> and 12 <sup>th</sup> week 8 hours	Functions of two variables: Limit, continuity and partial derivatives; Total derivative, Jacobian, Taylor series, Maxima, minima and saddle points; Method of Lagrange multipliers;	
<u>5</u>	13 <sup>th</sup> and 14 <sup>th</sup> week 8 hours	Double and triple integrals, change of variables, multiple integral in cylindrical and spherical coordinates	

**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**



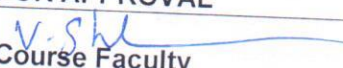
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- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students 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

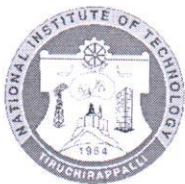
Students can meet the course faculty for discussion after the class hours in office no #220, Department of Mathematics by fixing appointment through e-mail (vshanthi@nitt.edu) during office hours (9.30 am to 5.00 pm).

FOR APPROVAL

  
Course Faculty  
DR. V. SHANTHI

CC- Chairperson 

HOD 



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**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.