

**NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI- 620 015**

**DEPARTMENT OF MATHEMATICS**

<b>COURSE OUTLINE TEMPLATE</b>		
Course Title	<b>Mathematics – I</b>	
Course Code	<b>MAIR 11</b>	No. of Credits : <b>4</b>
Department	<b>Mathematics</b>	Section: <b>ECE A &amp; B</b>
Pre-requisites Course Code	<b>+2 Mathematics</b>	
Course Teacher(s)/Tutor(s)	Email Id	Telephone No.
<b>Dr. V. Lakshmana Gomathi Nayagam</b>	<b>velulakshmanan@nitt.edu</b>	<b>9486001191</b>
Course Type	<b>Core course</b>	
<b>COURSE OVERVIEW</b>		
<p><b>To understand the mathematical applications to engineering problems using matrix theory, convergence concepts, functions of several variables and multiple integrals.</b></p>		
<b>COURSE OBJECTIVES</b>		
<p><b>To acquire basic knowledge in mathematics and to apply in engineering disciplines.</b></p>		
<b>COURSE OUTCOMES (CO)</b>		
Course Outcomes	Aligned Programme Outcomes(PO)	
<ol style="list-style-type: none"> <li><b>1. To apply matrix analysis for Engineering Problems</b></li> <li><b>2. To formulate real problems with multi dimensions</b></li> <li><b>3. To understand the convergence and divergence in practical problems</b></li> </ol>	<p><b>The students will apply their knowledge of mathematics to engineering problems.</b></p>	

## COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
	<b>Week 1</b>	<ol style="list-style-type: none"> <li>1. Review of basic definitions on Matrix Theory.</li> <li>2. Finding Eigen values and Eigen vectors.</li> <li>3. Finding the roots for symmetric matrices.</li> <li>4. More Problems +Tutorial</li> </ol>	Chalk and Talk/ PPT
	<b>Week 2</b>	<ol style="list-style-type: none"> <li>5. Properties of Eigen values and Eigen vectors.</li> <li>6. CHT- without proof-verification.</li> <li>7. Applications of CHT.</li> <li>8. More problems + Tutorial.</li> </ol>	
	<b>Week 3</b>	<ol style="list-style-type: none"> <li>9. Diagonalization-problems.</li> <li>10. More problems</li> <li>11. Quadratic forms- required definitions.</li> <li>12. Problems + Tutorial.</li> </ol>	
	<b>Week4</b>	<ol style="list-style-type: none"> <li>13. Revision on Sequences.</li> <li>14. Series-definitions- series of +ve terms.</li> <li>15. Problems using the tests.</li> <li>16. More Problems + Tutorial.</li> </ol>	Chalk and Talk/ PPT
	<b>Week 5</b>	<ol style="list-style-type: none"> <li>17. More problems.</li> <li>18. Alternating series- Leibnitz test</li> <li>19. More problems.</li> <li>20. Tutorial.</li> </ol>	
	<b>Week 6</b>	<b>Assessment-I</b>	Chalk and Talk/ PPT
	<b>Week 7</b>	<ol style="list-style-type: none"> <li>21. Differentiation-Review.</li> <li>22. Partial derivatives-problems.</li> <li>23. Transformation problems</li> <li>24. More problems +Tutorial</li> </ol>	
	<b>Week 8</b>	<ol style="list-style-type: none"> <li>25. Functions of two variables</li> <li>26. Problems for max., min.</li> <li>27. More problems</li> <li>28. Jacobian + Tutorial</li> </ol>	
	<b>Week 9</b>	<ol style="list-style-type: none"> <li>29. Problems.</li> <li>30. Properties of Jacobian-Problems</li> <li>31. More problems.</li> <li>32. Revision problems + Tutorial</li> </ol>	

	<b>Week 10</b>	33. Concept of integration 34. Double and triple integration. 35. Change the order of integration 36. Problems	
	<b>Week 11</b>	37. More Problems +Tutorial 38. Applications of double integral 39. Problems 40. Other co-ordinate systems	Chalk and Talk / PPT
	<b>Week 12</b>	<b>Assessment-II</b>	
	<b>Week 13</b>	<b>Reassessment</b> 41. Problems 42. Conversion-problems 43. More Problems  <b>Assessment-III</b> 44. Overall revision.	

#### COURSE ASSESSMENT METHODS

S.No.		Week/Date	Duration	% Weightage
1.	Assessment –I	6 <sup>th</sup> week	1 Hour	20%
2.	Assessment-II	12 <sup>th</sup> week	1 Hour	20%
3.	Reassessment	13 <sup>th</sup> week	1 Hour	
4.	Assessment- III (Assignment)			10%
5.	Assessment –IV		3 Hours	50%
6.	Reassessment for Absentees & Poor scorers			
				Total : 100 Marks



**ESSENTIAL READINGS : Textbooks, reference books**

**Text Books**

1. Kreyszig, E., *Advanced Engineering Mathematics*, 9th edition, John Wiley Sons, 2006.
2. Grewal, B.S., *Higher Engineering Mathematics*, 42nd edition, Khanna Publications, Delhi, 2012.
3. Hsiung, C.Y. and Mao, G.Y. *Linear Algebra*, World Scientific Pub Co Inc., 1999.

**Reference Books**

1. Apostol, T.M. *Calculus Volume I & II Second Edition*, John Wiley & Sons (Asia) 2005.
2. Greenberg, M.D. *Advanced Engineering Mathematics*, Second Edition, Pearson Education Inc. (First Indian reprint), 2002
3. Strauss. M.J, Bradley, G.L. and Smith, K.J. *Calculus*, 3rd Edition, Prentice Hall, 2002.
4. T Veerarajan, *Engg Mathematics for First year McGraw-Hill Education (India) Pvt Limited*, 2007.

**COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)**

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**COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)**

In case of 74%- 51% of attendance, the student should attend the mandatory classes for the required shortage of hours. If it is less than 50% , the student should redo the course.

**FOR SENATE'S CONSIDERATION**

Course Faculty \_\_\_\_\_

v. later  
07/08/17

CC-Chairperson

*B. N. Mahalingam*

HOD

*S. Jeyamma*  
10/8/2017