

NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI- 620 015

DEPARTMENT OF MATHEMATICS

COURSE OUTLINE TEMPLATE			
Course Title	MAIR 11 : Mathematics – I		
Course Code	MAIR 11	No. of Credits	4
Department	Mathematics	Faculty	EEE A SECTION
Pre-requisites Course Code	+2, MATHEMATICS		
Course Coordinator	Dr. T.N.janakiraman, janaki@nitt.edu , 9894794198,9489066245		
Other Course	Teacher(s)/Tutor(s)	Email Id	Telephone No.
1	Dr. T. N. Janakiraman	janaki@nitt.edu	9894794198(Personal) 3669(Intercom) 9489066245(official)
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
COURSE OVERVIEW			
To understand the mathematical applications to engineering problems using matrix theory, convergence of series, calculus with functions several variables.			
COURSE OBJECTIVES			
To acquire basic knowledge in matheamatics and to apply in engineering disciplines.			
COURSE OUTCOMES (CO)			
Course Outcomes		Aligned Programme Outcomes (PO)	
1. To apply matrix analysis for Engineering Problems 2. To formulate real problems with multi dimensions using algebra & calculus. 3. To understand the convergence and divergence in practical problems.			

COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
	Week- 1	<p>1. Introduction to Characteristic equation of a matrix – Eigen values and Eigen vectors.(Theory and Applications)</p> <p>2. Problems related to Eigen values p and Eigen vectors. (Symmetric and Non-symmetric matrices with distinct and repeated Eigen values)</p> <p>3. Properties of eigen values.</p> <p>4. Properties continued and introduction to similarity and orthogonal Transformation.</p>	Chalk and Talk
	Week – 2	<p>5. Diagonalization of matrix(Using both similarity and orthogonal transformations).</p> <p>6. Cayley-Hamilton(C-H) Theorem (without proof) verification</p> <p>7. Finding Inverse and Power of a matrix using C-H Theorem.</p> <p>8. Quadratic form +Tutorial</p>	
	Week -3	<p>9. Definite and indefinite forms</p> <p>10. Orthogonal reduction of quadratic form to canonical form + Theory and problems and Tutorial</p>	
	Week -4	<p>11. Introduction to Sequences of real numbers - Limit of sequence, Convergent and divergent sequences + Tutorial</p> <p>12. Introduction series. Series as limit of sequences, convergence and divergence of series and overview of proposed tests of convergence.</p> <p>13. Standard series and their properties.</p> <p>14. Comparison test and Problems to use this test.</p>	

	Week - 11	<p>38. Change of Variables from Cartesian to Spherical and Cylindrical polar system +Some problems.</p> <p>39. Some more problems.</p> <p>38. Volume using double and triple integrals. (Two sessions)</p>	Chalk and Talk
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COURSE ASSESSMENT METHODS

S.No.		Week/Date	Duration	% Weightage
1.	Cycle Test –I	6 th week	1 Hour fifteen minutes	20%
2.	Cycle Test-II	10 th week	1 Hour fifteen minutes	20%
3.	Retest	11 th week	1 Hour fifteen minutes	20%(Only for the students who didn't appear for at least one of the Cycle tests- Test portion for the retest is the portions covered for both cycle tests I and II)
4.	Assignments (Two)			10%
5.	End Semester Exam	December Second week	3 Hours	50%
				Total : 100 Marks

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

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. M K Venkataraman, *Engineering mathematics, Volume I, 2nd ed.*, National Publishing Co. 2003

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 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)

Feed back at the end of the course may be given with their rating

- (i) To the expected use of this course for their higher studies;
- (ii) To teacher's involvement, capacity, authority and approach to introduce this course in UG level; and
- (iii) To improve understanding and further applications need for addition of some new contents and also removal of unrelated topics need to be obtained.


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

1. Minimum 75% attendance in general.
2. In genuine case, with medical certificate minimum 65% attendance.
3. Cycle test I and II -20 marks each.
4. Duration cycle each of the cycle tests 1(1/4) hours.
5. Assignments have to be submitted before the respective cycle tests.

ADDITIONAL COURSE INFORMATION

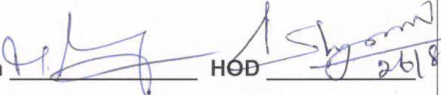
The Course Coordinator can be contacted through the contact numbers given or mail address for the availability time for discussion.

FOR SENATE'S CONSIDERATION


Course Faculty _____

CC-Chairperson _____

HOD _____


26/8/2016