

**DEPARTMENT OF MATHEMATICS
FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY**

SEMESTER I

MA1021- ALGEBRA AND CALCULUS

ACADEMIC YEAR: 2013-2014

LECTURE SCHEME / PLAN

The objective is to equip the students of Engineering and Technology, the knowledge of Mathematics and its applications so as to enable them to apply them for solving real world problems.

The list of instructions (provided below) may be followed by a faculty relating to his/her own schedule includes warm-up period, controlled/free practice, and the respective feedback of the classes who handle. The lesson plan has been formulated based on high quality learning outcomes and the expected outcomes are as follows

Each subject must have a minimum of 56 hours, which in turn, 45 hours for lecture and rest of the hours for tutorials. The faculty has to pay more attention in insisting the students to have $\leq 95\%$ class attendance.

UNIT I: MATRICES			
Lect. No	Lesson schedule	Learning outcomes	Cumulative hours
L 1.1	Review Topics: Types of matrices, operation in matrices, Determinants, properties	Students are able to understand the applications of matrices	1
L1.2	Rank of Matrix: Elementary Transforms		2-3
L.1.3	Inverse of a matrix by gauss - Jordan method linear independence		4-5
L.1.4	Consistency of system of equations - Rouche's Theorem (statement only)		6-7
L.1.5	Eigen values and Eigen vectors – problems		8-9
L.1.6	Cayley – Hamilton Theorem – verification & applications		10-11
L.1.7	Tutorial		Students able to solve problems themselves
CYCLE TEST – I :			DATE: 07.08.2013
UNIT II: DIFFERENTIAL CALCULUS & APPLICATIONS			
L.2.1	Review Topics: Limit, continuity concepts - methods of differentiation		13
L.2.2	Calculus of one variable: Curvature		14
L.2.3	Radius of curvature - Cartesian type		15

L.2.4	Radius of curvature – Polar type	To be familiarized with the fundamental phenomena and applications in Differential calculus	
L.2.5	Centre & circle of curvature		
L.2.6	Calculus of two variables: Partial differentiation – simple problems		16
L.2.7	Homogeneous functions Euler's Theorem		17
L.2.8	Maxima and Minima - saddle point problems		18
L.2.9	Lagrange's multiplier method (simple problems)		19
L.2.10	Tutorial	Students able to solve problems themselves	20
CYCLE TEST – II :		DATE: 04.09.2013	
UNIT III: NUMERICAL INTEGRATION			
L.3.1	Introduction to Numerical integration	Learners will understand the concept of numerical integration of a definite integral for a given function from a given set of tabular values	25
L.3.2	Trapezoidal rule and its applications		26-27
L.3.3	Problems based on Simpson's 1/3 rd rule		28-29
L.3.4	Simpson's 3/8th rule and its applications		30-31
L.3.5	Error formula - order of error		32-33
L.3.6	Weddle's rule - problems		34-35
L.3.7	Tutorial	Students able to solve problems themselves	36
SURPRISE TEST			
UNIT IV: ANALYTICAL GEOMETRY (THREE DIMENSIONAL)			
L.4.1	Three dimensional Analytical geometry - Introduction	To inculcate understanding of the application of three dimensional analytical geometry	37
L.4.2	Direction cosines, Direction ratios – Angle between lines - simple problems		38-39
L.4.3	Plane: Equation of plane - Angle between planes - Distance between parallel planes		40-41
L.4.4	St. Line: Equations of straight line –symmetrical and unsymmetrical forms – problems		42-43
L.4.5	Coplanar lines – applications		44-45

L.4.6	Shortest distance between skew lines - Problems		46-47
L.4.7	Tutorial	Students able to solve problems themselves	48
UNIT V: APPLICATIONS OF INTEGRATION			
L.5.1	Review: Techniques of integration	Students are acquiring the applications of integration in the study of architecture	49
L.5.2	Curve tracing - plane curves - Cartesian & polar form		50-52
L.5.3	Procedure for curve tracing in parametric form		53-54
L.5.4	Area bounded by curve – Arc length of curve - volume & surface Area of solids of revolution.		55-57
L.5.5	Introduction to sphere, cone, cylinder quadratic surface & solids of revolutions		58-59
L.5.6	Tutorial	Students able to solve problems themselves	60
MODEL EXAM		11.11.2013	(Duration: 3 Hours)
LAST WORKING DAY : 20.11.2013			

REFERENCES

- Dr. K. Ganesan, Dr. Sundarammal Kesavan, Prof. K. S. Ganapathy Subramanian, Dr. V. Srinivasan, Engineering Mathematics I, Gamma Publications, 2010.
- Grewal B.S., Higher Engineering Mathematics, 35th edition, Khanna Publishers, 2000.
- Veerarajan. T. Theory and problems in Numerical Methods, Tata McGraw Hill Publishing Co., New Delhi, 2004.
- Veerarajan T., Engineering Mathematics, Tata McGraw Hill Publishing Co., New Delhi, 2000.
- Kandasamy P etal. Engineering Mathematics, Vol. I (4th revised edition), S. Chand & Co., New Delhi, 2000.
- Venkataraman M.K., Engineering Mathematics - First Year (2nd edition), National Publishing Co., Chennai, 2000.
- Narayanan S., Manicavasagam Pillay T.K., Ramanaiah G., Advanced Mathematics for Engineering students, Volume I (2nd edition), S. Viswanathan Printers and Publishers, 1992.
- Singaravelu, Numerical methods -Meenakshi Agency, Chennai -2004

WEB RESOURCES:

www.wikipedia.com

www.mit.ocw.in

www.sosmath.com

www.tutorial.math.lamar.edu

Internal marks Total: 50

Internal marks split up: Cycle Test 1: 10 Marks

Cycle Test 2: 10 Marks

Attendance: 5 marks

Model Exam: 20 Marks

Surprise Test: 5 marks

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