

Name of Programme : CE/EE/ET/ME/MT/CM/IT Engineering
Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26
Name of Course : APPLIED MAHEMATICS II
Course Code : SC182

Teaching Scheme:

	Hours / Week	Total Hours
Theory	03	48
Term work / Practical	01	16

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min. duration	Hrs	--	--	--
Marks	20	80	--	--	--

Rationale:

This subject intends to teach students basic facts, concepts, principles and procedure of Mathematics as a tool to analyze Engineering problems and as such it lays down foundation for the understanding of engineering science and core technology subjects.

Course Outcomes:

After completing this course students will be able to

1. Understand basic facts of Mathematics about the field of analysis of any Engineering problem.
2. Know the standard ways in which the problem can be approached.
3. Apply basic concepts to engineering problems.

Course Contents: (Course Name: Applied mathematics II – SC182)

A. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : FUNCTIONS AND LIMITS		13
1. Identify the function and find the value of function. 3. Evaluate limits of different types of functions.	1.1 Functions: Concept of functions, Types of functions (only definitions) 1.2 Limits: Concept of limits and limits of function (algebraic, trigonometric, logarithmic and exponential.)	
Unit 2: DERIVATIVES		16
1. Find the derivatives by first principle. 2. Solve problems using rules and methods of derivatives 3. apply derivative in engineering tools.	2.1 Definition of the derivative, derivatives of standard Functions. 2.2 Differentiation of sum, difference, product and quotient of two or more functions 2.3 Differentiation of composite, inverse, implicit functions. 2.4 Differentiation of parametric, exponential and logarithms functions. 2.5 Successive differentiation.	
Unit 3: APPLICATIONS OF DERIVATIVES		05
1. Find slope and equations of tangent and normal 2. calculate maxima and minima of function	3.1 Geometrical meaning of derivative (Equations of tangents and Normals) 3.2 Maxima and minima of functions.	
Unit 4: VECTORS		06
1. Define different types of vectors 2. Find dot and cross product of vectors 3. Find work done and moment of force about the point and line	4.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication) 4.2 Dot (Scalar) product with properties. 4.3 Vector (Cross) product with properties. 4.4 Work done and moment of force about a point & line	
Unit 5: NUMERICAL METHODS		08
1. Find the approximate root of algebraic equation 2. Solve the system of equations in three unknowns	5.1 Solution of algebraic equations : Bisection method, Regulafalsi method and Newton –Raphson method. 5.2 Solution of simultaneous equations containing 2 and 3 Unknowns :Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's method	

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B. List of Practicals /Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1.	Examples on function	Function and Limits	1
2.	Examples on algebraic limits		1
3.	Examples on trigonometric limits		1
4.	Examples on exponential and logarithmic limits		1
5	Examples on differentiation of sum, difference, product and quotient of two or more functions and composite function.	Derivative	1
6.	Examples on differentiation of exponential , logarithms , inverse, implicit functions.		1
7.	Examples on differentiation of parametric function and Successive differentiation.		1
8.	Examples on equation of tangent & normal & determination of maxima & minima of fuction.	Application of derivative	1
9.	Examples on properties f dot and cross product of vectors.	Vector	1
10	Examples on Work done and moment of force about a point & line		1
11	Solution of algebraic equations : Bisection method, Regulafalsi method and Newton – Raphson method.	Numerical methods	1
12	Solution of simultaneous equations containing 2 and 3Unknowns :Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's method		1
	Skill Test		02
		Total Hrs.	14

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Function and Limit	Class room teaching , chalk board
2	Derivatives	Class room teaching , chalk board
3	Application of derivatives	Class room teaching , chalk board
4	Vector	Class room teaching , chalk board
5	Numerical methods	Class room teaching , chalk board

Specification Table for Theory Paper:

Unit No.	Units	Levels from Cognition Process Dimension			Total Marks
		R	U	A	
01	Function and Limit	04(04)	08(04)	06(02)	18(10)
02	Derivatives	08(04)	16(08)	00(00)	24(12)
03	Application of derivatives	00(00)	00(00)	08(04)	08(04)
04	Vector	04(02)	04(00)	06(04)	14(06)
05	Numerical methods	04(02)	04(02)	08(04)	16(08)
	Total	20(12)	32(14)	28(14)	80(40)

R-Remember

U – Understand

A – Analyze / Apply

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	4	1	U	4	1	U	4	1	A	4	1	U	4	1	R	4	4/6
02	2	R	4	2	U	4	2	U	4	2	U	4	2	R	4	2	U	4	4/6
03	3	A	4	3	A	4	3	A	4	4	R	4	4	U	4	4	A	4	4/6
04	4	A	4	5	R	4	5	U	4	5	A	4	2	U	4	5	A	4	4/6
05	1	A	2	1	A	2	2	R	2	2	R	2	2	U	2	2	U	2	8/12
	4	A	2	4	R	2	5	A	2	5	A	2	5	U	2	5	R	2	

T= Unit/Topic Number

L= Level of Question

M = Marks

R-Remember

U-Understand

A-Analyze/ Apply

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Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	CA (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test Answer sheets	1,2,3
		Class Room Assignments		Assignments	--	--	Assignment Book	1,2,3
				TOTAL	20	--	--	--
	TEE (Term End Examination)	End Exam	Students	End Of the Course	80	28	Theory Answer sheets	
Direct Assessment Practical	CA (Continuous Assessment)	--	Students	--	--	--	--	--
		--		--	--	--	--	
	TEE (Term End Examination)	--	Students	--	--	--	--	--
Indirect Assessment	Student Feedback on course		Students	After First PT	Student feed back form			
	End Of Course			End Of The Course	Questionnaires			

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Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	3	3	2	1	2	1	2	3	2	2
2	3	3	2	2	1	1	2	3	2	1
3	3	3	3	2	1	1	2	2	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Engineering Mathematics Vol.I	Vishwanath , Satya Prakashan, New Delhi	--
2	Mathematic for polytechnic students I & II	S.P. Deshpande ,Pune Vidyarthi Griha Prakashan	--
3	Mathematics for Engineering Vol-I	H.K. Dass ,S.Chand and Company	--
4	Engineering Mathematics vol-I and II	Shantinarayan ,S.Chand and Company	--

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Chairman PBOS	
2.	Shri . V.B.Shinde	Faculty from Institute	Govt. Polytechnic Pune
3.		Faculty from Institute	
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

Prepared by

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(Member Secretary PBOS)

(Chairman PBOS)