

Ability Enhancement Course 3rd SEMESTER
Mathematics I for EE/EC Stream

CourseCode	22DMATE 31	Coursetype	AEC	CreditsL-T-P	1-0-0
Hours/week:L-T-P	1-0-0			Totalcredits	1
TotalContactHours	L = 20 Hrs; T = 0 Hrs; P = 0 Hrs Total = 20 Hrs			CIEMarks	50
FlippedClassescontent	5 Hours			SEEMarks	50

Course learning objectives	
1.	Review basic differentiation
2.	Get acquainted with different applications of partial differentiation
3.	Get familiar with various topics in Linear Algebra.
5.	Understand the basic concepts of multiple integral.

Required Knowledge of: Basic Trigonometry, Calculus, Algebra

Unit– I: Calculus	Contact Hours =5Hours
Introduction to limits, continuity and differentiation: Polar Curves, angle between radius vector and tangent, angle between polar curves, Radius of curvature (Cartesian and polar form)	

Unit–II: Partial Differentiation	Contact Hours =5Hours
Definition and simple problems. Total Differentiation-Problems. Partial Differentiation of Composite functions – Problems. Maxima and minima of function of two variables. Jacobians.	

Unit – III: Linear Algebra I
Rank of a matrix by elementary transformation, consistency of system of linear equations-Gauss Jordan method and Gauss-Seidal method. Eigen value and Eigen vectors – Rayleigh’s Power method.

Unit– IV: Multiple Integrals	Contact Hours =5Hours
Cylindrical and spherical polar coordinates. Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates. Applications to find: Area and Volume by double integral. Problems	

Flipped Classroom Details

Unit No.	I	I I	III	IV
No. for flipped Classroom Sessions	1	1	1	2

Books	
Text Books:	
1.	B.S. Grewal – Higher Engineering Mathematics, Khanna Publishers, 42 nd Edition, 2012.
2.	Erwin Kreyszig –Advanced Engineering Mathematics, John Wiley & Sons Inc., 9 th Edition, 2006.
3.	B. V.Ramana- Higher Engineering Mathematics, Tata McGraw-Hill Education Private Limited, Tenth reprint 2010 and onwards.
Reference Books:	
1.	Peter V. O’ Neil – Advanced Engineering Mathematics, Thomson Brooks/Cole, 7 th Edition, 2011.
2.	Glyn James – Advanced Modern Engineering Mathematics, Pearson Education, 4 th Edition, 2010.

Coursedeliverymethods		Assessmentmethods	
1.	ChalkandTalk	1.	IAtests
2.	PPT andVideos	2.	OpenBookAssignments(OBA)/LabProject
3.	FlippedClasses	3.	LabTest
4.	Practicesession/DemonstrationsinLabs	4.	SemesterEndExamination
5.	VirtualLabs(ifpresent)		

Course Outcome (COs)				
At the end of the course, the student will be able to (Highlight the action verb representing the learning level.)				
Learning Levels: Re - Remember; Un - Understand; Ap - Apply; Evaluate; Cr - Create	An - Analysis; Ev -	Learning Level	PO(s)	PSO(s)
1.	Review basics of Differentiation and Integration	L1	1	1
2.	Review basic concepts of Calculus.	L1	1	1
3.	Understand basic Linear Algebra	L2	1	1
4.	Understand multivariable Calculus.	L1	1	1

CO-POMapping(planned)												CO-PSO Mapping(planned)			
C	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1	PO1	PSO1	PSO2	PSO3
O											1	2			
1	√														
2	√														
3	√														
4	√														

Scheme of Continuous Internal Evaluation(CIE):Theory course (Non-Integrated)

Components	AdditionofCIEcomponents	TotalMarks
WrittenTest	30	50
Two quizzes	20	

Scheme of Semester End Examination (SEE):Theory course(Non-Integrated)

Components	TotalMarks
Written exams	50

Ability Enhancement Course 3rd SEMESTER
Mathematics I for CS /IS Stream

CourseCode		CourseType	AEC	CreditsL-T-P	1-0-0
Hours/week:L-T-P	1-0-0			Total credits	1
TotalContactHours	L = 20 Hrs; T = 0 Hrs; P = 0 Hrs Total = 20 Hrs			CIEMarks	50
FlippedClassescontent	5 Hours			SEEMarks	50

Course learning objectives	
1.	Review basic differentiation and Integration
1.	Get acquainted with different applications of Calculus.
2.	Understand modular arithmetic.
5.	Get familiar with various topics in Linear Algebra.

Required Knowledge of: Basic Trigonometry, Calculus, Algebra

Unit– I: Basic Differentiation, Integration	Contact Hours =5 Hours
Rate of change, increasing/decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations). Integration of a variety of functions by substitution, by partial fractions and by parts, Basic properties of definite integrals and evaluation of definite integrals.	

Unit–II: Calculus	Contact Hours =5 Hours
Series expansion of functions (Taylor’s and Maclaurin’s series) Polar Curves, angle between radius vector and tangent, angle between polar curves,.	

Unit – III: Modular Arithmetic:
Introduction to congruences, Linear Congruences, The Chinese Remainder theorem, Solving Polynomials, Linear Diophantine Equation, System of Linear Congruences, Euler’s Theorem, Wilson Theorem and Fermat’s little theorem (only statements) .

Unit– IV: Linear Algebra I	Contact Hours =5 Hours
Rank of a matrix by elementary transformation, consistency of system of linear equations-Gauss Jordan method and Gauss-Seidal method. Eigen value and Eigen vectors – Rayleigh’s Power method.	

Flipped Classroom Details

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No. for FlippedClassroomSessions	1	1	1	2

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Course delivery methods		Assessment methods	
1.	Chalk and Talk	1.	IA tests
2.	PPT and Videos	2.	Open Book Assignments (OBA)/Lab Project
3.	Flipped Classes	3.	Lab Test
4.	Practical session/Demonstrations in Labs	4.	Semester End Examination
5.	Virtual Labs (if present)		

Course Outcome (COs)				
At the end of the course, the student will be able to (Highlight the action verb representing the learning level.)				
Learning Levels: Re - Remember; Un - Understand; Ap - Apply; Analysis; Ev - Evaluate; Cr - Create	An -	Learning Level	PO(s)	PSO(s)
1.	Review basics of Differentiation and Integration	L1	1	1
2.	Review basic concepts of Calculus.	L1	1	1
3.	Understand modular arithmetic	L2	1	1
4.	Understand basic Linear Algebra.	L1	1	1

CO-PO Mapping (planned)													CO-PSO Mapping (planned)		
C	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
1	√														
2	√														
3	√														
4	√														

Scheme of Continuous Internal Evaluation (CIE): Theory course (Non-Integrated)

Components	Addition of CIE components	Total Marks
Written Test	30	50
Two quizzes	20	

Scheme of Semester End Examination (SEE): Theory course (Non-Integrated)

Components	Total Marks
Written exams	50

Ability Enhancement Course 3rd SEMESTER

Mathematics I for Civ/Aero/Mech Stream

CourseCode	22DMATC 31	Coursetype	AEC	CreditsL-T-P	1-0-0
Hours/week:L-T-P	1-0-0			Totalcredits	1
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Unit– I: Basic Differentiation, Integration	ContactHours =5Hours
<p>Rate of change, increasing/decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).</p> <p>Integration of a variety of functions by substitution, by partial fractions and by parts, Basic properties of definite integrals and evaluation of definite integrals.</p>	

Unit–II: Calculus	Contact Hours =5Hours
<p>Introduction to limits, continuity and differentiation: Polar Curves, angle between radius vector and tangent, angle between polar curves, Radius of curvature (Cartesian and polar form only).</p>	

Unit – III: Partial Differentiation	ContactHours =5Hours
<p>Definition and simple problems. Total Differentiation-Problems. Partial Differentiation of Composite functions – Problems. Maxima and minima of function of two variables. Jacobians.</p>	

Unit– IV: Linear Algebra	ContactHours =5Hours
<p>Rank of a matrix by elementary transformation, consistency of system of linear equations-Gauss Jordan method and Gauss-Seidal method. Eigen value and Eigen vectors – Rayleigh’s Power method.</p>	

Flipped Classroom Details

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2.	Review basic concepts of Calculus.	L1	1	1
3.	Understand multivariable Calculus.	L2	1	1
4.	Understand basic Linear Algebra.	L1	1	1

CO-PO Mapping(planned)													CO-PSO Mapping(planned)		
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	√														
2	√														
3	√														
4	√														

Scheme of Continuous Internal Evaluation(CIE):Theory course (Non-Integrated)

Components	Addition of CIE components	Total Marks
Written Test	30	50
Two quizzes	20	

Scheme of Semester End Examination (SEE): Theory course (Non-Integrated)

Components	Total Marks
Written exams	50