SREYAS
INSTITUTE OF ENGINEERING AND TECHNOLOGY
AUTONOMOUS

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Department of Mathematics
Board of Studies – First meeting on 21-10-2022 at 12:30 pm
AGENDA

- Review/Approval of the detailed syllabus of Matrices and Calculus,
- Review/Approval of the detailed syllabus of Ordinary differential equations and vector calculus.
- Any other suggestions /advice to the department.

MINUTES OF BOARD OF STUDIES MEETING:

- The meeting was held at the conference hall, SIET, on 21 October 2022 at 12:30P.M. The Head of the Department H&S, extended his warm welcome to Dr. Y.Raja Shekhar Reddy, Asst. Prof. of Mathematics, JNTUH, UCEJ, Dr. YVK. Ravi Kumar, Assoc. Prof. of Mathematics, BITS Pilani, Hyderabad.

- The BOS approved the syllabus of **Matrices and Calculus, Ordinary differential equations and vector calculus** for the following Branches: Civil, Mech, ECE, CSE, CSE-AIML, CSE-DS. (Common to all)

- The committee suggested to change the number of classes as per the topics.

Board of Studies Meeting

Members Attended

S.No	Name	Designation	Position	Signature
1.	Mr. Md.Naseeruddin	HoD, H&S Department	Chairman	
2.	Dr. Y.Raja Shekhar Reddy	Asst. Prof. of Mathematics, JNTUH, UCEJ	University Nominee	
3.	Prof. M.V.Ramana Murthy	Retd Professor of Mathematics, Osmania University	Subject Expert	
4.	Dr. YVK. Ravi Kumar	Assoc.Prof. of Mathematics, BITS Pilani, Hyderabad	Subject Expert	
5.	Dr. T.Haripriya	Assoc.Prof. of Mathematics, SIET	Specialized Faculty-1	
6.	Dr. B.Suresh Babu	Assoc.Prof. of Mathematics, SIET	Specialized Faculty-2	B. Suresh
7.	Mr. K.Santhosh	Asst. Prof. of Mathematics, SIET	Specialized Faculty-3	K.Santhosh
8.	Mrs. Ch.Vasavi	Asst.Prof, SIET	Faculty	
9.	Mr. B.Vidya Sagar	Asst.Prof, SIET	Faculty	
10.	Mrs. T.Sailaja	Asst.Prof, SIET	Faculty	

SREYAS INSTITUTE OF ENGINEERING AND TECHNOLOGY
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MATRICES AND CALCULUS
(Common to CIVIL,MECH,ECE,CSE,CSE(AIML),CSE(DS))

B.Tech. I Year I Sem.

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3 1 0 4

Pre-requisites: Mathematical Knowledge at pre-university level

UNIT-I: Matrices   10 L
Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Gauss Seidel Iteration Method.

UNIT-II: Eigen values and Eigen vectors   10 L
Linear Transformation and Orthogonal Transformation: Eigenvalues, Eigenvectors and their properties, Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT-III: Calculus   10 L
Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's Series.
Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT-IV: Multivariable Calculus (Partial Differentiation and applications)   10 L
Definitions of Limit and continuity.
Partial Differentiation: Euler's Theorem, Total derivative, Jacobian, Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration)   10 L
Evaluation of Double Integrals (Cartesian and polar coordinates), change of order of integration (only Cartesian form), Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.
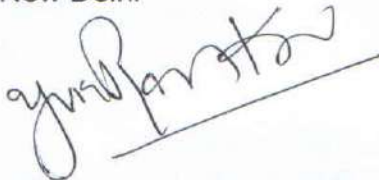Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

REFERENCE BOOKS:

1. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
(COMMON TO CIVIL,MECH,ECE,CSE, CSE (AIML), CSE(DS))

B.Tech. I Year II Sem.

L	T	P	C
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Pre-requisites: Mathematical Knowledge at pre-university level

UNIT-I: First Order ODE   8 L
Exact differential equations, Equations reducible to exact differential equations, linear and Bernoulli's equations, Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling, Law of natural growth and decay.

UNIT-II: Ordinary Differential Equations of Higher Order   10 L
Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax}, $\sin ax$, $\cos ax$, polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$, method of variation of parameters, Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation. Applications: Electric Circuits

UNIT-III: Laplace transforms   10 L
Laplace Transforms: Laplace Transform of standard functions, First shifting theorem, Second shifting theorem, Unit step function, Dirac delta function, Laplace transforms of functions when they are multiplied and divided by 't', Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transform of periodic functions, Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV: Vector Differentiation   10 L
Vector point functions and scalar point functions, Gradient, Divergence and Curl, Directional derivatives, Tangent plane and normal line, Vector Identities, Scalar potential functions, Solenoidal and Irrotational vectors.

UNIT-V: Vector Integration   10 L
Line, Surface and Volume Integrals, Theorems of Green, Gauss and Stokes (without proofs) and their applications.

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1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010

2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

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1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.