



VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN

(An Autonomous Institution)

[Sponsored by Lavu Educational Society, Affiliated to JNTUH & Approved by AICTE, New Delhi]
Kondapur (V), Ghatkesar (M), Medchal - Malkajgiri (D) - 501 301. Phone: 96529 10002/3



Department of Mathematics

3rd Board of Studies Meeting on 03rd January 2026

AGENDA

Item No.	Agenda Item		
1.0	Review & Confirmation Items		
1.1	Review & Confirmation of the Minutes of Meeting of the 2 nd Board of Studies meeting held on 18 th August 2025.		
2.0	Approval Items		
2.1	Approval of syllabus for II B.Tech. I Semester (VR25).		
	S. No.	Name of the Subject	Branches
	1.	Mathematical & Statistical Foundations	IT, CSE[AI&ML], CSE[DS]
	2	Computational Mathematics Lab	
2.2	Approval of syllabus for II B.Tech. II Semester (VR25).		
	S. No.	Name of the Subject	Branches
	1.	Computer Oriented Statical Methods	CSE
	2.	Numerical Methods & Complex Variables	ECE
	3.	Computational Mathematics Lab	ECE & CSE
3.0	Any other items with permission of Chair		


(Dr. T. Srinivasulu)
Chairman, BoS



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Department of Mathematics

3rd Board of Studies Meeting on 03rd January 2026

Members Present:

S. No.	Name of the Member	Designation	Organization	Role	Signature
1	Dr. T. Srinivasulu	Professor & Dean	VMTW, Hyderabad.	Chairman	
2	Dr. B. Ravindra Reddy	Professor	UCE, JNTUH	Member (JNTUH Nominee)	
3	Dr P. Suresh	Assistant Professor (Sr. Grade)	CBIT, Hyderabad	Member (Academician)	
4	Dr. T. Yugandhar	Associate Professor	Anurag University, Hyderabad	Member (Academician)	
5	Mr. P. Bhaskar Reddy	Data Scientist.	TCS, Hyderabad	Member (Industry)	
6	Dr. P. Prasanth Kumar	Associate Professor	VMTW, Hyderabad.	Member	
7	Dr. D. Chenna Kesavaiah	Associate Professor	VMTW, Hyderabad.	Member	
8	Mr. K. Santhosh Kumar	Assistant Professor	VMTW, Hyderabad.	Member	
9	Mrs. R. Manjula	Assistant Professor	VMTW, Hyderabad.	Member	
10	Mrs. J. Rajitha	Assistant Professor	VMTW, Hyderabad.	Member	
11	Mr. V. Madhukar	Assistant Professor	VMTW, Hyderabad.	Member	
12	Mr. S. Siva Kumar	Assistant Professor	VMTW, Hyderabad.	Member	
13	Mr. B. Vidyasagar	Assistant Professor	VMTW, Hyderabad.	Member	
14	Dr. R. Sridhar	Professor & HoD	VMTW, Hyderabad.	Special Invitee	

MINUTES BOOK

Vignan's Institute of Management & Technology for Women (An Autonomous Institutions & Accredited by NBA & NAAC)

Minutes of the 3rd Board of Studies (BoS) of Mathematics meeting held on
03rd January 2026, 02:30PM at Conference Hall (Online), VMTW

The following members has present

1. Dr. T. Srinivasulu
2. Dr. B. Ravindra Reddy
3. Dr P. Suresh
4. Dr. T. Yugandhar
5. Mr. P. Bhaskar Reddy
6. Dr. P. Prasanth Kumar
7. Dr. D. Chennai Kesavaiah
8. Mr. K. Santhosh Kumar
9. Mrs. R. Manjula
10. Mrs. J. Rajitha
11. Mr. V. Madhukar
12. Mr. S. Siva Kumar
13. Mr. B. Vidyasagar
14. Dr. R. Sridhar

The Quorum (minimum 40%) was satisfied.

The Chairman, BoS welcomed all the members to the meeting of the Board of Studies.

Proceedings of the meeting of the Board of Studies

1.0 Review & Confirmation Items

1.1 Review & Confirmation of the Minutes of Meeting of the 2nd Board of Studies meeting held on 18th August 2025.

The Chairman, BoS presented the Minutes of the Meeting of the 2nd Board of Studies held on 18th August 2025.

Minutes of the Meeting of the 2nd Board of Studies held on 18th August 2025 were confirmed by the Board.

2.0 Approval Items

2.1 Approval of syllabus for II B.Tech. I Semester (VR25).

The Chairman, BoS proposed the following subjects syllabus of **II B.Tech. I Semester (VR25)** to the Board for review and approval (Annexure-I).

S. No.	Name of the Subject	Branches
1.	Mathematical & Statistical Foundations	IT, CSE[AI&ML], CSE[DS]
2	Computational Mathematics Lab	

After detailed deliberations, the Board approved the syllabus as presented.

2.2 Approval of syllabus for II B.Tech. I Semester (VR25).

The Chairman, BoS presented the following subjects syllabus of **II B.Tech. II Semester (VR25)** to the Board for review and approval (Annexure-II).

S. No.	Name of the Subject	Branches
1.	Computer Oriented Statical Methods	CSE
2.	Numerical Methods & Complex Variables	ECE
3.	Computational Mathematics Lab	ECE & CSE

After detailed deliberations, the Board approved the syllabus as presented.

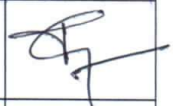
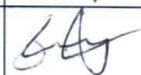
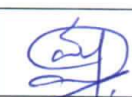
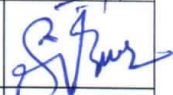
3.0 Any other item with the permission of the Chair

Mr. P. Bhaskar Reddy suggested enriching the existing syllabi with additional Statistical topics to enhance students' employability and to better prepare them for emerging interdisciplinary areas such as Data Science, Artificial Intelligence, Machine Learning, and Analytics.


(Dr. T. Srinivasulu)
Chairman-BoS

Vignan's Institute of Management & Technology for Women
(An Autonomous Institutions & Accredited by NBA & NAAC)

Minutes of the 3rd Board of Studies (BoS) meeting held on 03rd January 2026, 02:30PM
at Conference Hall (Online), VMTW

S. No.	Name	Designation	Organization	Position in BoS	Signature
1	Dr. T. Srinivasulu	Professor & Dean	VMTW, Hyderabad.	Chairman	
2	Dr. B. Ravindra Reddy	Professor	UCE, JNTUH	Member (JNTUH Nominee)	
3	Dr P. Suresh	Assistant Professor (Sr. Grade)	CBIT, Hyderabad	Member (Academician)	
4	Dr. T. Yugandhar	Associate Professor	Anurag University, Hyderabad	Member (Academician)	
5	Mr. P. Bhaskar Reddy	Data Scientist.	TCS, Hyderabad	Member (Industry)	
6	Dr. P. Prasanth Kumar	Associate Professor	VMTW, Hyderabad.	Member	
7	Dr. D. Chenea Kesavaiah	Associate Professor	VMTW, Hyderabad.	Member	
8	Mr. K. Santhosh Kumar	Assistant Professor	VMTW, Hyderabad.	Member	
9	Mrs. R. Manjula	Assistant Professor	VMTW, Hyderabad.	Member	
10	Mrs. J. Rajitha	Assistant Professor	VMTW, Hyderabad.	Member	
11	Mr. V. Madhukar	Assistant Professor	VMTW, Hyderabad.	Member	
12	Mr. S. Siva Kumar	Assistant Professor	VMTW, Hyderabad.	Member	
13	Mr. B. Vidyasagar	Assistant Professor	VMTW, Hyderabad.	Member	
14	Dr. R. Sridhar	Professor & HoD	VMTW, Hyderabad.	Special Invitee	

B.Tech. L T P C
II Year - I Semester 3 0 0 3

MATHEMATICAL AND STATISTICAL FOUNDATIONS
(Common for IT, CSE(AI&ML) & CSE(Data Science))

Course Objectives:

- To learn the Number Theory basic concepts useful for cryptography etc.
- To learn the theory of Probability, and probability distributions of single random variables.
- To learn the sampling theory and testing of hypothesis and making inferences.
- The curve fitting, correlation and regression for the given data. the fundamentals of computers.

Course Outcomes: The student will learn

- To apply fundamental concepts of number theory, including GCD, prime factorization, and the Euclidean algorithm, to solve problems involving linear congruences.
- To compute and analyze the mean and variance of discrete random variables using Binomial and Poisson distributions in real-world contexts.
- Apply properties of the normal distribution and the Central Limit Theorem to analyze sampling distributions and solve practical probability problems.
- Analyze and evaluate statistical hypotheses for large and small samples to draw valid conclusions about means, proportions, and variances.
- Apply least squares and regression techniques to model data relationships and evaluate non-parametric associations using rank correlation methods.

UNIT-I: Basics of Number Theory 10 L

Greatest Common Divisors and Prime Factorization: Greatest common divisors – The Euclidean algorithm – The fundamental theorem of arithmetic – Factorization of integers and the Fermat numbers. Congruences: Introduction to congruences – Linear congruences.

UNIT-II: Random Variables and Probability Distributions 8 L

Concept of a Random Variable – Discrete Probability Distributions – Continuous Probability Distributions – Mean of a Random Variable – Variance of a Random Variable
Discrete Probability Distributions: Binomial Distribution – Poisson distribution

UNIT-III: Continuous Distributions and Sampling 10 L

Uniform Distribution – Normal Distribution – Areas under the Normal Curve – Applications of the Normal Distribution – Normal Approximation to the Binomial Distributions. Fundamental Sampling Distributions: Random Sampling – Some Important Statistics – Sampling Distributions – Sampling Distribution of Means – Central Limit Theorem.

UNIT-IV: Tests of Hypotheses (Large and Small Samples) 10 L

Statistical Hypotheses: General Concepts – Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two mean (Unknown for equal variance). One sample: Test on a single proportion. Two samples: Tests on two proportions. Two- sample tests concerning variances: F-distribution

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5)  (P. Bhaskar Reddy).

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11) V. Madhukar 

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UNIT-V: Applied Statistics

10 L

Curve fitting by the method of least squares – Fitting of straight lines – Second degree parabolas and more general curves – Correlation and Regression – Rank correlation.

Text Books:

1. **Kenneth H. Rosen, Elementary** Number Theory & its Applications, sixth edition, Addison Wesley, ISBN 978 0-321-50031-1.
2. **Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye,** Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
3. **S C Gupta and V K Kapoor,** Fundamentals of Mathematical Statistics, Khanna publications.

Reference Books:

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and statistics for Engineers and scientists, academic press.

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13) Sp 14) Sp

B.Tech. ECE

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II Year - II Semester

3 0 0 3

Numerical Methods and Complex Variables**Course Objectives:**

- To understand the fundamentals of Fourier series and Fourier transforms and their role in solving engineering and scientific problems.
- Develop competence in numerical methods for solving algebraic, transcendental equations, interpolation, and integration problems.
- Apply numerical techniques to solve ordinary differential equations arising in engineering applications.
- Analyze the concepts of complex differentiation and analyticity to study properties of complex functions.
- Apply principles of complex integration and residue theory for evaluating integrals and analyzing singularities.

Course Outcomes: The student will learn to

- Demonstrate the ability to develop Fourier series and Fourier sine/cosine transforms for given functions and interpret their significance in engineering applications.
- Apply appropriate numerical techniques, including bisection, Newton–Raphson, Regula–Falsi, and interpolation methods, to solve algebraic and transcendental equations.
- Implement standard numerical integration schemes and numerical methods to obtain approximate solutions of first-order ordinary differential equations.
- Analyze complex-valued functions for analyticity and harmonic properties using Cauchy–Riemann equations and determine the corresponding harmonic conjugates.
- Evaluate complex integrals and examine the nature of singularities using Taylor series, Laurent series, and the residue theorem.

UNIT-I: Fourier Series & Fourier Transforms

8 L

Fourier series – Dirichlet's Conditions – Half-range Fourier series – Fourier Transforms: Fourier Integral Theorem (Only statements), Fourier Sine and Cosine transforms (Elementary illustrations)

UNIT-II: Numerical Methods-I

10 L

Solution of polynomial and transcendental equations: Bisection method – Iteration Method – Newton Raphson method and Regula-Falsi method. Finite differences: forward differences – backward difference – central differences – symbolic relations – Interpolation using Newton's forward and backward difference formulae – Lagrange's method of interpolation.

UNIT-III: Numerical Methods-II

10 L

Numerical integration: Trapezoidal rule - Simpson's 1/3rd and 3/8th rules. Ordinary differential equations: Taylor's series – Euler's method – Runge-Kutta method of fourth order for first order ODE.

UNIT-IV: Complex Differentiation

10 L

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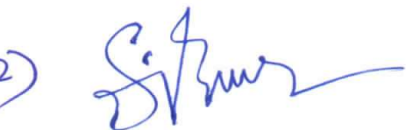
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Differentiation of Complex functions – Analyticity – Cauchy-Riemann equations (without proof) – Harmonic Functions – Finding harmonic conjugate – Milne-Thomson method – Elementary analytic functions (exponential, trigonometric, logarithm) and their properties.

UNIT-V: Complex Integration

10 L

Line integral – Cauchy's theorem – Cauchy's Integral formula – Zeros of analytic functions – Singularities – Taylor's series – Laurent's series. Residues – Cauchy Residue theorem (All theorems without Proof).

Text Books:

1. **B.S. Grewal**, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. **S.S. Sastry**, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.

Reference Books:

1. Murray R. Spiegel, Ph.D., Seymour Lipschutz, Ph.D., John J. Schiller, Ph.D., Dennis Spellman, Ph.D., Complex Variables (Schaum's outline).
2. M. K. Jain, S.R.K. Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations, New Age International publishers.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Edition, Mc-Graw Hill, 2004.

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B.Tech.

L T P C

II Year - I Semester

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Computational Mathematics Lab

(Common for IT, CSE(AI&ML) & CSE (Data Science))

Course Objectives:

- To Solve problems of Eigen values and Eigen Vectors using Python/MATLAB.
- To Solve Algebraic and Transcendental Equations using Python/MATLAB
- To Solve problems of Linear system of equations
- To Solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients.
- To Solve problems of Applied Statistics

Course Outcomes: The student will learn

- Calculate eigenvalues and eigenvectors of matrices and construct their geometric representations to explain how linear transformations scale and rotate vectors.
- Apply bracketing and open numerical methods to locate roots of nonlinear equations and illustrate the step-by-step convergence behavior graphically.
- Execute iterative algorithms for linear systems and analyze the rate of convergence by comparing graphical residuals between Jacobi and Gauss-Seidel methods.
- Model real-world physical systems use ordinary differential equations and evaluate their behavior through numerical solution plots (e.g., population growth or cooling).
- Appraise experimental data by deriving best-fit curves and correlation coefficients to quantify and visualize the strength of relationships between variables.

Visualize all solutions Graphically through programmes

UNIT - I: Eigen values and Eigenvectors:

6P

Programs:

- Finding real and complex Eigen values.
- Finding Eigen vectors.

UNIT-II: Solution of Algebraic and Transcendental Equations

6P

Bisection method, Newton Raphson Method

Programs:

- Root of a given equation using Bisection method.
- Root of a given equation Newton Raphson Method.

UNIT-III: Linear system of equations:

6P

Jacobi's iteration method and Gauss-Seidel iteration method

Programs:

- Solution of given system of linear equations using Jacobi's method
- Solution of given system of linear equations using Gauss-Seidel method

UNIT-IV: First-Order ODEs & Higher order LDE with constant coefficients

12P

Exact and non-exact equations, Applications: exponential growth/decay, Newton's law of cooling.

Programs:

- Solving exact and non-exact equations

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- Solving exponential growth/decay and Newton's law of cooling problems
- Solving homogeneous ODEs
- Solving non-homogeneous ODEs

UNIT-V: Applied Statistics

6P

Programs:

Curve Fitting – Straight Line & Second-Degree Curve

Karl Pearson's Correlation Coefficient

Regression Lines y on x & x on y

Spearman's Rank Correlation (With & Without Ties)

Combined Statistical Analysis

Textbooks:

1. MATLAB and its Applications in Engineering, **Rajkumar Basal, Ashok Kumar Geo, Manoj Kumar Sharma**, Pearson publication.
2. **Kenneth A. Lambert**, The fundamentals of Python: First Programs, 2011, Cengage Learnings.
3. Think Python First Edition, by **Allen B. Downey**, Orielly publishing.
4. Introduction to Python Programming, **William Mitchell, Povel Solin, Martin Novak et al.**, NCLab Public Computing, 2012.
5. Introduction to Python Programming, ©**Jacob Fredslund**, 2007.

Reference Books:

1. An Introduction to Python, John C. Lusth, The University of Alabama, 2011.
2. Introduction to Python, ©Dave Kuhlman, 2008.

Minimum Requirement of Software & Hardware:

Computer Systems with Python/Scilab/MATLAB installed

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B.Tech. CSE

L T P C

II Year - II Semester

3 0 0 3

Computer oriented Statistical Methods**Course Objectives:**

- Introducing discrete and continuous random variables and their associated probability distributions, including Binomial and Poisson models.
- Particularly the Normal Distribution and highlight its central role in sampling theory and the Central Limit Theorem.
- Estimate population parameters such as means, proportions, and variances using point and interval estimation methods.
- Enabling students to make informed statistical decisions for both large and small sample scenarios.
- Enable application of statistical and predictive modeling tools, including curve fitting, correlation, and regression analysis, to analyze and interpret real-world data.

Course Outcomes: The student will learn to

- Apply Binomial and Poisson probability distributions to discrete random events and compute the expected value (mean) and variance of random variables.
- Apply the Normal Distribution to solve engineering and business problems and explain the role of the Central Limit Theorem in making population inferences from sample data.
- Estimate and analyze population parameters by computing confidence intervals and standard errors for single-sample and two-sample cases involving means, proportions, and variances.
- Formulate and perform appropriate hypothesis tests and evaluate statistical evidence to draw valid and justified conclusion.
- Develop mathematical models using the Method of Least Squares and analyze and evaluate relationships between variables through correlation and regression techniques.

UNIT-I: Random Variables and Probability Distributions

8 L

Concept of a Random Variable – Discrete Probability Distributions – Continuous Probability Distributions – Mean of a Random Variable – Variance of a Random Variable.

Discrete Probability Distributions: Binomial Distribution – Poisson distribution

UNIT-II: Continuous Distributions and sampling

10 L

Uniform Distribution – Normal Distribution – Areas under the Normal Curve – Applications of the Normal Distribution – Normal Approximation to the Binomial Distributions. Fundamental Sampling Distributions: Random Sampling – Some Important Statistics – Sampling Distributions – Sampling Distribution of Means – Central Limit Theorem.

UNIT-III: Estimation

10 L

Introduction – Statistical Inference – Classical Methods of Estimation – Single Sample: Estimating the mean – Standard error of a point estimate. Two samples: Estimating the difference between two means– Single sample: Estimating a proportion – Two samples:

1. Two2. mean3. Estimating a proportion4. Two samples

5. ~~MS~~ (P. Bharan Reddy)

6. PM

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8. ~~MS~~ ✓ K. Santhosh Kumar.

9. ~~MS~~ R. Manigula

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11. ~~MS~~ ✓ V. Madhukar

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13. ~~MS~~ ✓

14. ~~MS~~ ✓

Estimating the difference between two proportions– Two samples: Estimating the ratio of two variances.

UNIT-IV: Tests of Hypotheses (Large and Small Samples)

10 L

Statistical Hypotheses: General Concepts – Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two means (Unknown for equal variance). One sample: Test on a single proportion. Two samples: Tests on two proportions. Two- sample tests concerning variances: F-distribution.

UNIT-V: Applied Statistics

10 L

Curve fitting by the method of least squares – Fitting of straight lines – Second degree parabolas and more general curves – Correlation and Regression – Rank correlation.

Textbooks:

1. **Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye**, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
2. **S C Gupta and V K Kapoor**, Fundamentals of Mathematical statistics, Khanna publications.
3. **S.D.Sharma**, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi.

Reference Books:

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, 2004.
2. Sheldon M Ross, Probability and Statistics for Engineers and scientists, academic press
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

Online Resource:

1. Introduction to Probability - **Dimitri Bertsekas, John N. Tsitsiklis** - Google Books
<https://share.google/kLuxAuRBw0wS6PRrk>

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II Year - II Semester	0	0	2	1

Computational Mathematics Lab
(Common for ECE & CSE)

Course Objectives:

- To Solve problems of Eigen values and Eigen Vectors using Python/MATLAB.
- To Solve Algebraic and Transcendental Equations using Python/MATLAB
- To Solve problems of Linear system of equations
- To Solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients.
- To Solve problems of Applied Statistics

Course Outcomes: The student will learn

- Calculate eigenvalues and eigenvectors of matrices and construct their geometric representations to explain how linear transformations scale and rotate vectors.
- Apply bracketing and open numerical methods to locate roots of nonlinear equations and illustrate the step-by-step convergence behavior graphically.
- Execute iterative algorithms for linear systems and analyze the rate of convergence by comparing graphical residuals between Jacobi and Gauss-Seidel methods.
- Model real-world physical systems use ordinary differential equations and evaluate their behavior through numerical solution plots (e.g., population growth or cooling).
- Appraise experimental data by deriving best-fit curves and correlation coefficients to quantify and visualize the strength of relationships between variables.

Visualize all solutions Graphically through programmes

UNIT - I: Eigen values and Eigenvectors: 6P

Programs:

- Finding real and complex Eigen values.
- Finding Eigen vectors.

UNIT-II: Solution of Algebraic and Transcendental Equations 6P

Bisection method, Newton Raphson Method

Programs:

- Root of a given equation using Bisection method.
- Root of a given equation Newton Raphson Method.

UNIT-III: Linear system of equations: 6P

Jacobi's iteration method and Gauss-Seidel iteration method

Programs:

- Solution of given system of linear equations using Jacobi's method
- Solution of given system of linear equations using Gauss-Seidel method

UNIT-IV: First-Order ODEs & Higher order LDE with constant coefficients 12P

Exact and non-exact equations, Applications: exponential growth/decay, Newton's law of cooling.

Programs:

- Solving exact and non-exact equations

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- Solving exponential growth/decay and Newton's law of cooling problems
- Solving homogeneous ODEs
- Solving non-homogeneous ODEs

UNIT-V: Applied Statistics

6P

Programs:

Curve Fitting – Straight Line & Second-Degree Curve

Karl Pearson's Correlation Coefficient

Regression Lines y on x & x on y

Spearman's Rank Correlation (With & Without Ties)

Combined Statistical Analysis

Textbooks:

1. MATLAB and its Applications in Engineering, **Rajkumar Basal, Ashok Kumar Geo, Manoj Kumar Sharma**, Pearson publication.
2. **Kenneth A. Lambert**, The fundamentals of Python: First Programs, 2011, Cengage Learnings.
3. Think Python First Edition, by **Allen B. Downey**, Orielly publishing.
4. Introduction to Python Programming, **William Mitchell, Povel Solin, Martin Novak et al.**, NCLab Public Computing, 2012.
5. Introduction to Python Programming, ©**Jacob Fredslund**, 2007.

Reference Books:

1. An Introduction to Python, John C. Luth, The University of Alabama, 2011.
2. Introduction to Python, ©Dave Kuhlman, 2008.

Minimum Requirement of Software & Hardware:

Computer Systems with Python/Scilab/MATLAB installed

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