D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY

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Accredited by A** Grade by NAAC & Accredited by NBA (B.Tech - CSC, ECE & EEE)

Balusumudi, BHIMAVARAM - 534 202, W.G.Dist., (A.P)

Fax No : 08816 - 221236, Phones : 08816 - 221237, 38, E-mail : dnrcet@gmail.com., web : www.dnrcet.org

Dt: 02-04-2025

Circular

Sub: DNR College of Engineering &Technology, Bhimavaram Department of BS&H (Mathematics) - Board of Studies meeting - Invitation - Reg.

.We take the privilege to invite you for the Board of Studies meeting at D N R College of Engineering & Technology in the Department of B S&H (Mathematics), on 04-04-2025 (FRIDAY) at 09:30 A. M. through Zoom online platform.

Agenda:

1. Welcome speech by Chairperson
2. Introduction of members
3. To discuss and finalize the proposed II B. Tech. I & II Semester Mathematics courses of DR -24 Regulations.
4. Finalization of Model Paper and Proposed List of Paper Setters.
5. To finalize the Evaluation procedure for Continuous Internal Evaluation(CIE) and Semester End Evaluation (SEE).
6. Ratification of Course Objectives and Course Outcomes, CO–PO Mapping for the proposed subjects.
7. Finalization of Text Books and Reference Books.
8. Brief review on I B.Tech Mathematics syllabus.

In this regard, all the members are requested to attend the online mode of Board of Studies meeting of Mathematics from the Department of B S&H on 04-04-2025 (Friday) at 09:30 A. M. The online meeting link will be mailed you shortly. Kindly accept our invitation and make it convenient to attend the meeting.

Thanking you Sir/Madam,

Yours faithfully,

Dr. G. G. Rathan
H O D, Basic Sciences & Humanities
D. N. R. College of Engineering & Technology

HEAD
Dept. of Basic Sciences
D.N.R. College of Engg. & Tech

Copy to:

1. The Principal, D N R C E T
2. The members of B O S
3. The Dean , Academics
4. Office file

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Bhimavaram,
Dt: 02/04/2025.

To
Dr Sd Sadik,
Professor &HOD Dept of FED,
CRR Engineering College, Eluru.

Respected sir,
Sub: D.N.R. College of Engineering &Technology, Bhimavaram, Department of BS&H (Mathematics) - Board of Studies meeting - Invitation - Reg.

We take the privilege to invite you for the Board of Studies meeting at D.N.R. College of Engineering & Technology in the Department of BS&H (Mathematics), on 04-04-2025 (FRIDAY) at 09:30 A.M. through Zoom online platform.

Agenda:

1. Welcome speech by Chairperson
2. Introduction of members
3. To discuss and finalize the proposed II B. Tech. I & II Semester Mathematics courses of DR -24 Regulations.
4. Finalization of Model Paper and Proposed List of Paper Setters.
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Thanking you Sir/Madam,

Yours faithfully,

Dr. G. G. Ratnam,
H O D, Basic Sciences & Humanities
D. N. R. College of Engineering & Technology

HEAD
Dept. of Basic Sciences
D.N.R. College of Engg. &
BHIMAVARAM-534

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Bhimavaram,
Dt: 02/04/2025.

To
Dr M Pushpa Latha,
Dept of Mathematics ,
SRKR Engineering College,
Bhim avaram, AP-534202.

Respected sir,
Sub: D.N.R. College of Engineering &Technology, Bhimavaram, Department of BS&H (Mathematics) - Board of Studies meeting - Invitation - Reg.

We take the privilege to invite you for the Board of Studies meeting at D.N.R. College of Engineering & Technology in the Department of BS&H (Mathematics), on 04-04-2025 (FRIDAY) at 09:30 A.M. through Zoom online platform.
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Yours faithfully,

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H O D, Basic Sciences & Humanities
D. N. R. College of Engineering & Technology

HEAD
Dept. of Basic Sciences
D.N.R. College of Engg. & Tech
BHIMAVARAM-534 2

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Bhimavaram,
Dt: 02/04/2025.

To
Dr V Ravindranath
Professor & Head, Dept of Mathematics ,
JNTUK, Kakinada

Respected sir,

Sub: D.N.R. College of Engineering &Technology, Bhimavaram, Department of BS&H (Mathematics) - Board of Studies meeting - Invitation - Reg.

We take the privilege to invite you for the Board of Studies meeting at D.N.R. College of Engineering & Technology in the Department of BS&H (Mathematics), on 04-04-2025 (FRIDAY) at 09:30 A.M. through Zoom online platform.

Agenda:

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5. To finalize the Evaluation procedure for Continuous Internal Evaluation (CIE) and Semester End Evaluation (SEE).
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Thanking you Sir/Madam,

Yours faithfully,

Dr. G. G. Ratnam,
H O D, Basic Sciences & Humanities
D. N. R. College of Engineering & Technology

HEAD
Dept. of Basic Sci.
D.N.R. College of Engg. &
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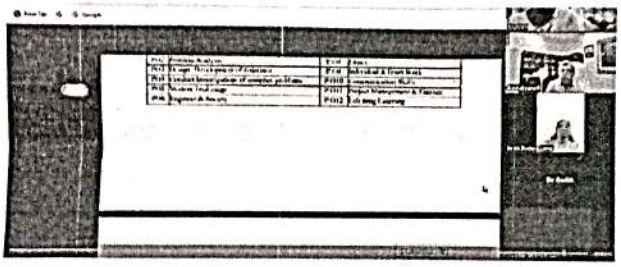
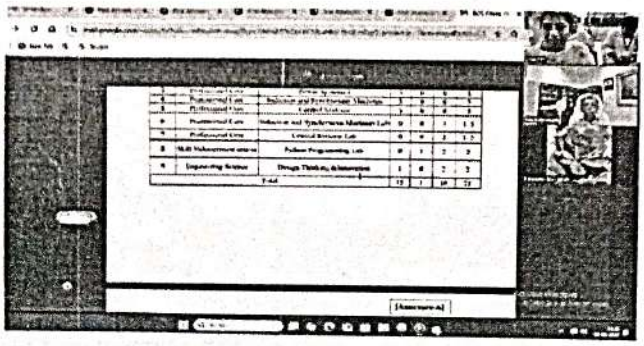
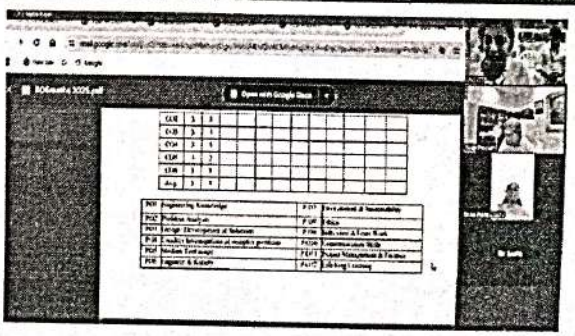
DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

BOS MATHS II B.Tech I & II Semester – SCREENSHOT 2025-26







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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

Dept of Basic Sciences & Humanities (Mathematics) Meeting of B O S Schedule, A. Y. 2025-26

Minutes of meeting of Board of Studies, Dept of Basic Sciences & Humanities (Mathematics) Held on 04-04-2025 at 09:30 A. M with the following points of agenda.

Venue: English Language Lab
Meeting held on: 04-04-2025 at 10:30 A. M
Mode of conducting meeting: Online Zoom App
Meeting link:

https://us05web.zoom.us/j/85622006591?pwd=e1XaO4KGbua0hl3ih68GP7V54KcJCu.1

Agenda:

1. Welcome speech by Chairperson
2. Introduction of members
3. To discuss and finalize the proposed DR -24 syllabus for II B. Tech I & II Semester for A.Y; 2025-26 onwads. [Annexure-A]
4. Finalization of Model question Paper and List of question Paper Setters.[Annexure-B]
5. To discuss and finalize the Evaluation procedure for Continuous Internal Evaluation(CIE) and Semester End Evaluation (S E E) [Annexure- C]
6. Ratification of Course Objectives and Course Outcomes, C O–P O mapping for the proposed subjects [Annexure- D].
7. Finalization of Text Books and Reference Books.[Annexure-E]
8. Any other item with the permission of the chairman.

Members Present:

S. No.	Name(s) of the Member(s)/	Designation	Designation in Committee	Status Attending	Signature
1.	Dr G G Ratnam	Professor & Head, Dept of B S&H	Chairperson	Yes	
2.	Dr V Ravindranath	Professor & Head, Dept of Mathematics J NT UK, Kakinada	Member (University Nominee)	Yes	2/6
3.	Dr M Pushpa Latha	Dept of Mathematics S RK R Engineering College, Bhimavaram	Member (Subject expert)	Yes	online
4.	Dr Sd Sadik	Professor &H OD Dept of FED, C RR Engineering College, Eluru	Member(Subject expert)	Yes	Online
5.	Ms. P Keerthi	Asst. Prof, DNRCET	Member	Yes	P. K
6.	Mrs. G Teja Sowmya	Asst. Prof, DNRCET	Member	Yes	G. Teja
7.	Mrs. V Vijaya Durga	Asst. Prof, DNRCET	Member	Yes	
8.	Mrs. N Madhavi	Asst. Prof, DNRCET	Member	Yes	
9.	Ms. P Venu Madhuri	Asst. Prof, DNRCET	Member	Yes	
10.	Mr. B. Pradeep	Asst. Prof, DNRCET	Member	Yes	
11.	Mrs. K Ramya Sri Krishna	Asst. Prof, DNRCET	Member	Yes	
12.	Mr. T. Pranams	Managing Director Pranams Hotels, Bhimavaram	Member (Industrial Expert)	Yes	
13.	Ms. K. Siva Syamala	R. No:149 P5 A0503 Batch:2013-17	Member (College alumni)	Yes	K.S.Syamala

[Annexure-A]

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
CIVIL ENGINEERING

B. Tech. II Year I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Numerical Techniques And Statistical Methods	3	0	0	3
2	H SM C	Universal human values–understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Surveying	3	0	0	3
4	Professional Core	Strength of Materials	3	0	0	3
5	Professional Core	Fluid Mechanics	3	0	0	3
6	Professional Core	Surveying Lab	0	0	3	1.5
7	Professional Core	Strength of Materials Lab	0	0	3	1.5
8	Skill Enhancement Course	Building Planning and Drawing	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			14	2	8	20

B. Tech. II Year– II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Managerial Economics & Financial Analysis	2	0	0	2
2	Engineering Science/Basic Science	Analog Circuits	3	0	0	3
3	Professional Core	Power Systems-I	3	0	0	3
4	Professional Core	Induction and Synchronous Machines	3	0	0	3
5	Professional Core	Control Systems	3	0	0	3
6	Professional Core	Induction and Synchronous Machines Lab	0	0	3	1.5
7	Professional Core	Control Systems Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming Lab	0	1	2	2
9	Engineering Science	Design Thinking &Innovation	1	0	2	2
Total			15	1	10	21

HEAD
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[Annexure-A]

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
ELECTRICAL AND ELECTRONICS ENGINEERING

B. Tech. II Year– I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Complex Variables & Numerical Methods	3	0	0	3
2	H SM C	Universal human values– understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Electro magnetic Field Theory	3	0	0	3
4	Professional Core	Electrical Circuit Analysis-I I	3	0	0	3
5	Professional Core	D C Machines & Transformers	3	0	0	3
6	Professional Core	Electrical Circuit Analysis-I I And Simulation Lab	0	0	3	1. 5
7	Professional Core	D C Machines & Transformers Lab	0	0	3	1. 5
8	Skill Enhancement Course	Data Structures Lab	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			15	2	10	20

B. Tech. II Year– II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Managerial Economics& Financial Analysis	2	0	0	2
2	Engineering Science/Basic Science	Analog Circuits	3	0	0	3
3	Professional Core	Power Systems-I	3	0	0	3
4	Professional Core	Induction and Synchronous Machines	3	0	0	3
5	Professional Core	Control Systems	3	0	0	3
6	Professional Core	Induction and Synchronous Machines Lab	0	0	3	1. 5
7	Professional Core	Control Systems Lab	0	0	3	1. 5
8	Skill Enhancement course	Python Programming Lab	0	1	2	2
9	Engineering Science	Design Thinking &Innovation	1	0	2	2
Total			15	1	10	21

4/3/24
HEAD
Sciences

[Annexure-A]

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
MECHANICAL ENGINEERING

B. Tech. II Year–I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Numerical Methods and Transform Techniques	3	0	0	3
2	H SM C	Universal Human Values– Understanding Harmony & Ethical Human Conduct	2	1	0	3
3	Engineering Science	Thermodynamics	2	0	0	2
4	Professional Core	Mechanics of Solids	3	0	0	3
5	Professional Core	Material Science and Metallurgy	3	0	0	3
6	Professional Core	Mechanics of Solids and Materials Science Lab	0	0	3	1. 5
7	Professional Core	Computer-aided Machine Drawing	0	0	3	1. 5
8	Engineering Science	Python programming Lab	0	0	2	1. 0
9	Skill Enhancement Course	Embedded Systems and I o T	0	1	2	2
10	Audit Course	Environmental Science	2	0	0	-
Total			15	2	10	20

B. Tech. II Year–II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Industrial Management	2	0	0	2
2	Basic Science	Complex Variables, Probability and Statistics	3	0	0	3
3	Professional Core	Manufacturing processes	3	0	0	3
4	Professional Core	Fluid Mechanics & Hydraulic Machines	3	0	0	3
5	Professional Core	Theory of Machines	3	0	0	3
6	Professional Core	Fluid Mechanics & Hydraulic Machines Lab	0	0	3	1. 5
7	Professional Core	Manufacturing processes Lab	0	0	3	1. 5
8	Skill Enhancement Course	Soft Skills	0	1	2	2
9	Engineering Science	Design Thinking & Innovation	1	0	2	2
Total			15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration during summer Vacation						

4/9/25

Dept. of Basic Sciences
D.N.R. College of Engg. & Tech
BHIMAVARAM-534 202.

[Annexure-A]

D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
COMPUTER SCIENCE ENGINEERING

B. Tech. II Year–I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	B S&H	Universal human values –understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Digital Logic & Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithm Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithm Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement Course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			16	2	8	20

B. Tech. II Year–II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Managerial Economics and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	Probability & Statistics	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	2	1	0	3
6	Professional Core	Operating Systems Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement Course	Full Stack Development–I	0	1	2	2
9	B S&H	Design Thinking & Innovation	1	0	2	2
			Total	14	2	10
Mandatory Community Service Project Internship of 08 weeks duration during Summer vacation						

HEAD
Dept. of Basic Sciences
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[Annexure-A]

D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

B. Tech. II Year–I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	B S&H	Universal human values– understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Artificial Intelligence	3	0	0	3
4	Professional Core	Advanced Data Structures &Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithms Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement Course	Python programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			16	2	8	20

B. Tech. II Year–II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	Probability & Statistics	3	0	0	3
3	Professional Core	Machine Learning	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	A I&ML Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack Development-1	0	1	2	2
9	B S&H	Design Thinking & Innovation	1	0	2	2
Total			15	1	12	21
Mandatory Community Service Project Internship of 08 weeks duration during Summer vacation						

HEAD
Dept. of Basic Sciences
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[Annexure-A]

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

B. Tech. II Year–I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	B S&H	Universal human values–understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Database Management Systems	3	0	0	3
4	Professional Core	Advanced Data Structures Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithms Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming Lab	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			16	2	8	20

B. Tech. II Year–II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Managerial Economic and Financial Analysis	2	0	0	2
2	Engineering Science/ Basic Science	Statistical methods for Data science	3	0	0	3
3	Professional Core	Artificial Intelligence	3	0	0	3
4	Professional Core	Introduction to Data Science	3	0	0	3
5	Professional Core	Digital Logic & Computer Organization	3	0	0	3
6	Professional Core	Artificial Intelligence Lab	0	0	3	1.5
7	Professional Core	Data Science using Python Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack Development-I	0	1	2	2
9	B S&H	Design Thinking & Innovation	1	0	2	2
Total			15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration during Summer vacation						

HEAD
Dept. of Basic Sciences
D.N.R. College of Engg. & Tech

[Annexure-A]

D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY
AUTONOMOUS

Approved by AICTE, New Delhi & Permanently Affiliated to JNTUK, Kakinada
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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

DR 24 - II Year COURSE STRUCTURE & SYLLABUS
INFORMATION TECHNOLOGY

B. Tech. II Year–I Semester

S. No	Category	Title	L	T	P	C
1	B S&H	Discrete Mathematics & Graph Theory	3	0	0	3
2	B S&H	Universal human values–understanding harmony and Ethical human conduct	2	1	0	3
3	Engineering Science	Digital Logic & Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithms	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures Lab	0	0	3	1. 5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1. 5
8	Skill Enhancement course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			16	2	8	20

B. Tech. II Year–II Semester

S. No	Category	Title	L	T	P	C
1	Management Course-I	Optimization Techniques	2	0	0	2
2	Engineering Science/ Basic Science	Probability & Statistics	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	3	0	0	3
6	Professional Core	Operating Systems & Software Engineering Lab	0	0	3	1. 5
7	Professional Core	Database Management Systems Lab	0	0	3	1. 5
8	Skill Enhancement Course	Python with D Jango	0	1	2	2
9	B S&H	Design Thinking & Innovation	1	0	2	2
Total			15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration during Summer vacation						

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year I Semester

NUMERICAL TECHNIQUES AND STATISTICAL METHODS
(for Civil Engineering)

Course Objectives:

- To elucidate the different numerical methods to solve non linear algebraic equations
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the students with the foundations of probability and statistical methods.
- To equip the students to solve application problems in their disciplines.

Course Outcomes:

1. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
2. Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations
3. Apply discrete and continuous probability distributions
4. Compute the mathematical expectation (mean) and variance of random variables
5. Design the components of a classical hypo thesistest
6. Infer the statistical inferential methods based on small and large sampling tests

UNIT–I: Iterative Methods:

Introduction–Solutions of algebraic and transcendental equations: Bisection method– Secant method– Method of false position–Iteration method–Newton- Raphson method (One variable and simultaneous Equations)

Interpolation: Newton's forward and backward formulae for interpolation–Interpolation with unequal intervals – Lagrange's interpolation formula

UNIT–II: Numerical integration, Solution of ordinary differential equations with initial conditions:

Trapezoidal rule– Simpson's $1/3^{rd}$ and $3/8^{th}$ rule– Solution of initial value problems by Taylor's series– Picard's method of successive approximations–Euler's method–Runge- Kutta method (second and fourth order) – Milne's Predictor and Corrector Method.

UNIT–III: Probability and Distributions:

Baye's theorem – Random variables – Discrete and Continuous random variables – Distribution functions– Probability mass function , Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions

UNIT–IV: Sampling Theory:

Introduction – Population and Samples – Sampling distribution of Means and Variance (definition only) – Point and Interval estimations – Maximum error of estimate – Central limit theorem (without proof) – Estimation using t, χ^2 and F-distributions.

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UNIT–V: Tests of Hypothesis:

Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type I I errors – Level of significance– One tail and two-tail tests–Test of significance for large samples and Small Samples: Single and difference means – Single and two proportions –Student's t-test, F-test, χ^2-test.

Textbooks:

1. B. S.Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. Miller and Freund's, Probabilityand Statistics for Engineers, 7/e, Pearson, 2008.

Reference Books:

1. Steven C. Chapra, Applied Numerical Methods with M ATLAB for Engineering and Science, Tata Mc. Graw Hill Education.
2. M. K. Jain, S. R. K. Iyengarand R. K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.
3. Lawrence Turyn, Advanced Engineering Mathematics, C R C Press.
4. S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.
5. Shron L. Myers, Keying Ye, Ronald E Walpole, Probabilityand Statistics Engineersand the Scientists, 8th Edition, Pearson 2007.
6. Jayl. Devore, Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage.

P.K.T.L.

8/04/2025

V. Chinnayya

N. Madhuri 8/4/25

G. Tejaswini 8/4

P. Venu Madhuri 8/4

K.R.S. Kaish

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year–I Semester

COMPLEXVARIABLES & NUMERICAL METHODS
(for EEE)

Course Objectives:

- To elucidate the different numerical methods to solve nonlinear algebraic equations
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the complex variables.
- To equip the students to solve application problems in their disciplines.

Course Outcomes:

1. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
2. Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations
3. Apply Cauchy-Riemannequationstocomplexfunctionsinordertodeterminewhetheragiven continuous functions analytic
4. Use the concept of conjugate harmonic functions to solve problems related to complex variables.
5. Evaluate the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues. Make use of the Cauchy residue theorem to evaluate certain integrals
6. Explain properties of various types of conformal mappings

UNIT–I: Iterative Methods:

Introduction–Solutions of algebraic and transcendental equations: Bisection method– Secant method – Method of false position – General Iteration method – Newton- Raphson method (Simultaneous Equations)

Interpolation: Newton's forward and backward formulae for interpolation–Interpolation with unequal intervals – Lagrange's interpolation formula

UNIT–II: Numerical integration, Solution of ordinary differential equations with initial conditions:

Trapezoidal rule– Simpson's 1/3rdand 3/8thrule– Solution of initial value problems by Taylor's series– Picard's method of successive approximations–Euler's method–Runge- Kutta method (second and fourth order)– Milne's Predictor and Corrector Method.

UNIT–III: Functions of a complex variable and Complex integration:

Introduction – Continuity – Differentiability – Analyticity –Cauchy-Riemann equations in Cartesian and polar coordinates – Harmonic and conjugate harmonic functions – Milne – Thompson method.

Complex integration: Line integral–Cauchy's integral theorem–Cauchy's integral formula –Generalized integral formula (all without proofs) and problems on above theorems.

UNIT–IV: Series expansions and Residue Theorem:

Radius of convergence–Expansion of function in Taylor's series, Maclaurin's series and Laurent series.

Types of Singularities Isolated–Essential singularities–Pole of order m–Residues–Residue theorem (without proof)– Evaluation of real integral of the types $\int_{-\infty}^{\infty} f(x)dx$ and $\int_{c}^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

UNIT–V: Conformal mapping:

Transformation by e^z, $\ln z$, z^2, z^n (n positive integer), Sin z, cos z, $z + a/z$. Translation, rotation, inversion and bilinear transformation–fixed point–cross ratio–properties– invariance of circles and cross ratio–determination of bilinear transformation mapping 3 given points.

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers. Edition
2. Micheael Greenberg, Advanced Engineering Mathematics, 2ndedition, Pearson

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. B. V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.
3. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and Science, Tata Mc. Graw Hill Education.
4. M. K. Jain, S. R. K. Iyengarand R. K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.
5. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 9thedition, Mc- Graw Hill, 2013

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year–I Semester

NUMERICAL METHODS AND TRANSFORM TECHNIQUES
(for ME)

Course Objectives:

- To elucidate the different numerical methods to solve non linear algebraic equations
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications.

Course Outcomes:

1. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
2. Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations
3. Apply the Laplace transform for solving differential equations
4. Calculate the Laplace transform of the unit step function and apply it in solving problems involving piece wise- defined functions.
5. Find or compute the Fourier series of periodic signals
6. Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic wave forms

UNIT–I: Iterative Methods:

Introduction–Solutions of algebraic and transcendental equations: Bisection method– Secant method– Method of false position – Iteration method – Newton-Raphson method (Simultaneous Equations)

Interpolation: Newton's forward and backward formulae for interpolation –Interpolation With unequal intervals–Lagrange's interpolation formula

UNIT–II: Numerical integration, Solution of ordinary differential equations with initial conditions:

Trapezoidal rule– Simpson's 1/3rdand 3/8thrule– Solution of initial value problems by Taylor's–Picard's method of successive approximations–Euler's method–Runge- Kutta method (second and fourth order) – Milne's Predictor and Corrector Method

UNIT – III: Laplace Transforms:

Definition of Laplace transform - Laplace transforms of standard functions – Properties of Laplace Transforms–Shifting theorems–Transforms of derivatives and integrals–Unit step function–Dirac's delta function–Inverse Laplace transforms–Convolution theorem (without proof).

Applications: Solving ordinary differential equations (initial value problems) and integral Differential equation using Laplace transforms.

UNIT–IV: Fourier series:

Introduction–Periodic functions–Fourier series of periodic function–Dirichlet's conditions – Even and odd functions– Change of interval–Half-range sine and cosine series.

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UNIT–V: Fourier Transforms:

Fourier integral theorem (without proof) –Fourier sine and cosine integrals–Infinite Fourier transforms–Sine and cosine transforms –Properties–Inverse transforms–Convolution theorem (without proof)–Finite Fourier transforms.

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. B. V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and Science, Tata Mc. Graw Hill Education.
3. M. K. Jain, S. R. K. Iyengarand R. K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.
4. Lawrence Turyn, Advanced Engineering Mathematics, C R C Press

P. Kanthi
08/04/2025
N. M. 8/4/25
G. Tejaswani 8/4
P. Venu Madhuri 8/4/2025
K. R. S. Krishna

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year I Semester

DISCRETEMATHEMATICS AND GRAPHTHEORY

For CSE,CSE (AI&ML),AI&DS,IT

Course Objectives:

- To introduce the students to the topics and techniques of discrete methods and Combinatorial reasoning.
- To introduce a wide variety of applications. The algorithmic approach to the solution of problems is fundamental in discrete mathematics, and this approach reinforces the close ties between this discipline and the area of computer science.

Course Outcomes:

At the end of the course students will be able to

1. Build skills in solving mathematical problems
2. Comprehend mathematical principles and logic
3. Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software
4. Differentiate between ordinary and circular permutations
5. Manipulate and analyzed at a numerically and/ or graphically using appropriate Software
6. How to communicate effectively mathematical ideas/results verbally or in writing

UNIT–I: Mathematical Logic

Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological
Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Indirect Method of Proof, Predicate Calculus: Predicates, Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus

.

UNIT-II: Set Theory

Sets: Operations on Sets, Principle of Inclusion-Exclusion, Relations: Properties, Operations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering, Hasse Diagrams, Functions: Bijective, Composition, Inverse, Permutation, and Recursive Functions, Lattice and its Properties.

UNIT-III: Combinatorics and Recurrence Relations

Basis of Counting, Permutations, Permutations with Repetitions, Circular and Restricted Permutations, Combinations, Restricted Combinations, Binomial and Multinomial Coefficients and Theorems.

Recurrence Relations

Generating Functions, Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots, Solving in homogeneous Recurrence Relation

UNIT-I V:Graph Theory

Basic Concepts, Graph Theory and its Applications, Subgraphs, Graph Representations: Adjacency and Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs

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Unit-V: Multi Graphs

Multigraphs, Bipartite and Planar Graphs, Euler's Theorem, Graph Colouring and Covering, Chromatic Number, Spanning Trees, Prim's and Kruskal's Algorithms, B F S and D F S
Spanning Trees

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Trembly and P. Manohar, Tata Mc Graw Hill.
2. Elements of Discrete Mathematics–A Computer Oriented Approach, C. L. Liuand D. P. Mohapatra, 3rd Edition, Tata Mc Graw Hill.
3. Theory and Problems of Discrete Mathematics, Schaum's Outline Series, Seymour Lipschutz and Marc Lars Lipson, 3rd Edition, Mc Graw Hill.

REFERENCE BOOKS:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India.
2. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busbyand Sharon Cutler Ross, P H I.
3. Discrete Mathematics, S. K. Chakraborthy and B. K. Sarkar, Oxford, 2011.
4. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K.H. Rosen, 7th Edition, Tata Mc Graw Hill.

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year II Semester

COMPLEX VARIABLES, PROBABILITY AND STATISTICS

(For ME)

Course Objectives:

- To familiarize the complex variables.
- To familiarize the students with the foundations of probability and statistical methods.
- To equip the students to solve application problems in their disciplines.

Course Outcomes:

At the end of the course students will be able to

1. Understand limit, continuity and differentiation of functions complex variables
2. Understand Cauchy's theorem and slove Cauchy's inergral formula
3. Analyze and solve probability distribution
4. Calculate expected values, variances, and higher-order moments for different probability distributions.
5. Study Some important quantities as the sample mean
6. Differentiate between one tailed and two tailed test

UNIT I: Functions of a complex variable and Complex integration

Introduction–Continuity –Differentiability– Analyticity –Cauchy-Riemann equations in Cartesian and polar coordinates–Harmonic and conjugate harmonic functions–Milne– Thompson method.

Complex integration: Line integral –Cauchy's integral theorem –Cauchy's integral formula–Generalized integral formula (all without proofs) and problems on above theorems.

UNIT–II: Series expansions and Residue Theorem

Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series.

Types of Singularities: Isolated–Essential–Pole of order m– Residues–Residue theorem(without proof)–

Evaluation of real integral of the types $\int_{-\infty}^{\infty} f(x)dx$ and $\int_{0}^{2\pi} f(\cos\theta, \sin\theta)d\theta$.

UNIT–III: Probability and Distributions

Review of probability and Baye's theorem – Random variables – Discrete and Continuous random variables – Distribution functions – Probability mass function, Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions.

UNIT–I V: Sampling Theory

Introduction–Population and Samples –Sampling distribution of Means and Variance (definition only)–Central limit theorem (without proof)–Representation of the normal theory distributions– Introduction to t, $\chi 2$ and F-distributions- point and interval estimations –maximum error of estimate.

UNIT–V: Tests of Hypothesis

Introduction–Hypothesis–Null and Alternative Hypothesis–Type I and Type II errors –Level of significance–One tail and two-tail tests–Tests concerning one mean and two means (Large and Small samples)–Tests on proportions.

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TEXT BOOKS:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers.
2. Miller and Freund's, Probability and Statistics for Engineers, 7/e, Pearson, 2008.

REFERENCE BOOKS:

1. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 9/e, Mc-Graw Hill, 2013.
2. S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand &Sons Publications, 2012.
3. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8/e, Cengage.
4. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists, 8/e, Pearson2007.
5. Sheldon, M. Ross, Introduction to probability and statistics Engineers and the Scientists, 4/e, Academic Foundation, 2011.

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year II Semester

PROBABILITY AND STATISTICS
For CSE, CSE (AI&ML),IT

Course Objectives:

- To familiarize the students with the foundations of probability and statistical methods
- To impart probability concepts and statistical methods in various application Engineering

Course Outcomes:

Upon successful completion of this course, the student should be able to

1. Classify the concepts of data science and its importance
2. Interprete association of characteristics and through correlation and regression tools
3. Apply discrete and continuous probability distributions
4. Identify and apply appropriate probability distributions to real world problems
5. Design the components of a classical hypothesis test
6. Infer the statistical inferential methods based on small and large sampling tests

UNIT– I: Descriptive statistics and methods for datascience:

Data science–Statistics Introduction–Population vs Sample –Collection of data –primary and secondary data – Type of variable: dependent and independent Categorical and Continuous variables – Data visualization – Measures of Central tendency – Measures of Variability – Skewness Kurtosis.

UNIT–II: Correlation and Regression:

Correlation – Correlation coefficient–Rank correlation.
Linear Regression:Straight line–Multiple Linear Regression-Regressioncoefficientsand properties –
Curvilinear Regression: Parabola – Exponential – Power curves.

UNIT–III: Probability and Distributions:

Probability–Conditional probability and Baye's theorem–Random variables–Discrete and Continuous random variables – Distribution functions – Probability mass function, Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions

UNIT–IV: Sampling Theory:

Introduction – Population and Samples – Sampling distribution of Means and Variance (definition only) – Point and Interval estimations – Maximum error of estimate–Central limit theorem (without proof) – Estimation using t, $\chi 2$ and F-distributions.

U N I T– V:Tests of Hypothesis:

Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type I I errors – Level of significance – One tail and two-tail tests – Test of significance for large samples and Small Samples:Single and difference means – Single and two proportions–Student's t- test, F-test, $\chi 2$ -test.

DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

TEXT BOOKS:

1. Miller and Freund's, Probability and Statistics for Engineers, 7/e, Pearson, 2008.
2. S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

REFERENCE BOOKS:

1. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists, 8th Edition, Pearson 2007.
2. Jayl. Devore, Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage.
3. Sheldon M. Ross, Introduction to probability and statistics Engineers and the Scientists, 4th Edition, Academic Foundation, 2011.
4. Johannes Ledolter and Robert V. Hogg, Applied statistics for Engineers and physical scientists, 3rd Edition, Pearson, 2010

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

II Year - II Semester

STATISTICAL METHODS FOR DATA SCIENCE
(For AIDS)

Course Objectives:

- This course aim set providing knowledge on basic concepts of Statistics, Estimation and testing of hypotheses for large and small samples.

Course Outcomes:

Student will be able to

1. Analyze data and draw conclusion about collection of data and fitting of distributions
2. Analyzing the testing of hypothesis for Large and small samples
3. Apply discrete and continuous probability distributions
4. Determine regression lines and model a best suit able curve for a given data using method of least squares.
5. Find various time series methods and apply in different fields
6. Understanding the classification using Logistic Regression

UNIT–I: Data Visualization and Distributions

Data Visualization Techniques: Introduction to Statistical methods-Exploratory Data Analysis- Charts (Line, Pie, Bar); Plots (Bubble, Scatter); Maps (Heat, Dot Distribution); Diagrams (Trees and Matrices)-Principal Components Analysis

Introduction to Data Distributions - Probability Distributions – discrete (binomial, Poisson), Continuous Distributions (Normal, exponential).

UNIT–II: Hypothesis Testing

Introduction to Parametric Estimation-Parametric Confidence Intervals Choosing a Statistic - Hypothesis Testing - Parametric test: the T-test - Applications to Hypothesis Tests-Pair wise comparisons.

UNIT-III: Linear Regression and Multiple Regression

Regression: Linear Regression, Curvilinear Regression: Exponential Regression- Polynomial Regression- Power Model. Practical Examples - The nature of the 'relationship' - Multiple Linear Regression - Important measurements of the regression estimate - Multiple Regression with Categorical Explanatory Variables - Inference in Multiple Regression - Variable Selection.

UNIT-IV: Time Series

Time series: Significance of Time series analysis, Component of Time series, Secular trend: Graphic method, Semi-average method, Method of moving averages, Method of least squares:straight line and non-linear trends, Logarithmic methods–Exponential trends, Growth curves, Seasonal Variations:Method of simple averages, Ratio- to -trend method, ratio-to- moving average method, Link relative method.

UNIT-V: Logistic Regression

The classification problem-Logistic Regression Setup-Interpreting the Results-Comparing Models-Classification Using Logistic Regression.

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DEPARTMENT OF BASIC SCIENCE AND HUMANITIES

TEXTBOOKS:

1. Elizabeth Purdom,"Statistical methodsfor Data science"
2. K. Murugesan, P. Gurusamy,"Probability, Statistics and Random Processes"

REFERENCE BOOKS:

1. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference–Testing of Hypotheses, Prentice Hall of India, 2014.
2. Robert V Hogg, Elliot A Tannisand Dale L. Zimmerman, Probability and Statistical Inference, 9thedition, Pearson publishers, 2013.
3. Chris Chatfield,"The analysis of time series an introduction,"5 th edition, Chapman & Hall/C R C.
4. Peter J. Brockwell, Richard A. Davis,"Introduction to Time series and Forecasting," Second edition, Springer.
5. Online Learning Resources: epurdom. github. io/Stat131 A/Rsupport/index. html.

P. K. T.
P. V. 08/04/2025
V. Chiranjeevi
N. M. 8/4/25
G. Tejeswar 8/4
P. Venu Madhavi 8/4/2025
K.R.S. Kaushik

HEAD
Dept. of Basic Sciences
D.N.R. College of Engg. & Tech
BHIMAVARAM-534 202.