LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.U. RAMBABU
Course Name & Code : Managerial Economics and Financial Analysis & 23HS02
L-T-P Structure : 2-0-0 **Credits:** 2
Program/Sem/Sec : B.Tech/CSE/IV /A **A.Y.:** 2025-26

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES(CEO):

To inculcate the basic knowledge of microeconomics and financial accounting
To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
To Know the Various types of market structure and pricing methods and strategy
To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
To provide fundamental skills in accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, students will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	–	–	–	–	2	–	1	–	–	–
CO2	3	2	2	1	1	–	–	–	–	2	–	1	–	–	–
CO3	3	2	1	1	1	1	1	–	2	3	–	1	–	–	–
CO4	3	2	2	1	1	–	–	–	1	2	2	1	–	–	–
CO5	3	2	2	1	2	–	–	–	1	3	2	1	–	–	–

1 - Low **2 –**Medium **3 -** High

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt https://www.slideshare.net/rossanz/production-and-cost-45827016 https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):SEC-A

UNIT-I: Introduction to Managerial Economics:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-12-2025		TLM2	
2.	Economics-Managerial Economics	1	04-12-2025		TLM2	
3.	Nature and Scope.	1	06-12-2025		TLM2/TLM3	
4.	Demand	1	09-12-2025		TLM2	
5.	Law of demand-	1	11-12-2025		TLM2	
6.	Elasticity of demand	1	16-12-2025		TLM2/TLM3	
7.	Types of Elasticity of demand	2	18-12-2025 20-12-2025		TLM1/TLM2	
8.	Demand Forecasting -Methods.	2	23-12-2025 27-12-2025		TLM2/TLM3	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Theory of Production and Cost analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Production Function	1	30-12-2025		TLM2	
10.	Isoquant and Isocost	1	01-01-2026 03-01-2026		TLM1/TLM2	
11.	Least Cost Combination of inputs	1	06-01-2026		TLM2	
12.	Law of Returns	1	13-01-2026		TLM2	
13.	Internal and External Economies of Scale.	2	15-01-2026 17-01-2026		TLM2	
14.	Cost Concepts	1	20-01-2026		TLM2	
15.	Break-even Analysis	2	22-01-2026 24-01-2026		TLM1	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		
I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)						

UNIT-III: Markets & Pricing Policies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	Market structures: Markets-Types of markets	1	03-02-2026		TLM2	
17.	Features	2	05-02-2026 07-02-2026		TLM2	
18.	price out determinations under Perfect competition	1	10-02-2026		TLM2	
19.	Monopoly, Monopolistic Competition	2	12-02-2026 17-02-2026		TLM2	
20.	Pricing –Pricing polices & its Objectives	1	19-02-2026		TLM2	
21.	Pricing Methods and its applications in business.	1	21-02-2026		TLM2	
No. of classes required to complete UNIT-III: 8				**No. of classes taken:**		

UNIT-IV: Unit -IV Capital and Capital Budgeting:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Nature and its significance,	1	24-02-2026		TLM2	
23.	Types of Capital	1	26-02-2026		TLM2	

24.	Sources of raising capital	1	28-02-2026		TLM2	
25.	Capital budgeting-Significance & Process	1	03-03-2026		TLM2	
26.	Techniques of Capital Budgeting (Non-Discounted)	2	05-03-2026 07-03-2026		TLM1	
27.	Techniques of Capital Budgeting (Discounted)	3	10-03-2026 12-03-2026 17-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Financial Accounting and analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Accounting –significance -	2	19-03-2026 21-03-2026		TLM2	
29.	Bookkeeping-Double entry system	1	24-03-2026		TLM2	
30.	Journal	1	26-03-2026		TLM1	
31.	Ledger	1	28-03-2026		TLM1	
32.	Trial Balance	1	31-03-2026		TLM1	
33.	Final Accounts with simple adjustments	1	28-03-2026		TLM1	
34.	Financial Statement Analysis through ratios.	2	31-03-2026 02-04-2026		TLM1	
No. of classes required to complete UNIT-V: 09				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Stock Market Essentials: Knowledge for Tomorrow's Leaders	1	04-04-2026		TLM2			
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III ,IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III ,IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.U. RAMBABU**	**Dr. A. ADISESHA REDDY**	**Dr. A. ADISESHA REDDY**	**Dr.S.Nagarjuna Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE-A
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. K.R. Kavitha
COURSE COORDINATOR: Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive Statistics and methods for Data Science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	01/12/2025		TLM1	CO1	T1,T2	
2.	Syllabus CO's, PO's	1	03/12/2025		TLM1	CO1	T1,T2	
3.	Unit-1, Introduction to data science	1	04/12/2025		TLM2	CO1	T1,T2	
4.	Statistics- Population and sample, Collection of data	1	06/12/2025		TLM1	CO1	T1,T2	
5.	Types of variables, Data Visualization	1	08/12/2025		TLM1	CO1	T1,T2	
6.	Measures of central tendency, A.M	1	10/12/2025		TLM1	CO1	T1,T2	
7.	Median problems	1	11/12/2025		TLM1	CO1	T1,T2	
8.	Mode problems		15/12/2025		TLM1	CO1	T1,T2	
9.	Measures of variability Range, Mean deviation	1	17/12/2025		TLM1	CO1	T1,T2	
10.	Standard Deviation	1	18/12/2025		TLM1	CO1	T1,T2	
11.	Quartile Deviation		22/12/2025		TLM1	CO1	T1,T2	
12.	Skewness, Kurtosis	1	24/12/2025		TLM1	CO1	T1,T2	
13.	TUTORIAL - I	1	20/12/2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Correlation, types	1	25/12/2025		TLM1	CO2	T1,T2	
2.	Coefficient of correlation	1	27/12/2025		TLM1	CO2	T1,T2	
3.	Problems	1	29/12/2025		TLM1	CO2	T1,T2	
4.	Rank correlation	1	31/12/2025		TLM3	CO2	T1,T2	
5.	Linear regression (lines)	1	03/01/2026		TLM1	CO2	T1,T2	
6.	Multiple regression	1	05/01/2026		TLM1	CO2	T1,T2	
7.	Regression coefficients	1	07/01/2026		TLM1	CO2	T1,T2	
8.	Properties, problems	1	08/01/2026		TLM1	CO2	T1,T2	
9.	Fitting of Straight line	1	19/01/2026		TLM1	CO2	T1,T2	
10.	Fitting of parabola	1	21/01/2026		TLM1	CO2	T1,T2	
11.	Fitting of power curve, Exponential curve	1	22/01/2026		TLM1	CO2	T1,T2	
12.	TUTORIAL - II	1	24/01/2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Probability, Introduction	1	02/02/2026		TLM1	CO3	T1,T2	
2.	Conditional probability	1	04/02/2026		TLM1	CO3	T1,T2	
3.	Bayes' theorem	1	05/02/2026		TLM1	CO3	T1,T2	
4.	Random variables, Expectations	1	07/02/2026		TLM1	CO3	T1,T2	
5.	Problems on PMF, PDF	1	09/02/2026		TLM1	CO3	T1,T2	
6.	Mathematical Expectations and Variance	1	11/02/2026		TLM1	CO3	T1,T2	
7.	Binomial distribution	1	12/02/2026		TLM1	CO3	T1,T2	
8.	Poisson distribution	1	16/02/2026		TLM1	CO3	T1,T2	
9.	Uniform distribution	1	18/02/2026		TLM1	CO3	T1,T2	
10.	Normal distribution	1	19/02/2026		TLM1	CO3	T1,T2	
11.	TUTORIAL - III	1	21/02/2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Sampling Theory

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction, Sampling distribution, definitions	1	23/02/2026		TLM1	CO4	T1,T2	
2.	Sampling distribution of mean, variance	1	25/02/2026		TLM1	CO4	T1,T2	
3.	Problems on central limit theorem	1	26/02/2026		TLM1	CO4	T1,T2	
4.	Estimation	1	28/02/2026		TLM1	CO4	T1,T2	
5.	Normal theory distributions	1	02/03/2026		TLM1	CO4	T1,T2	
6.	Estimation using t distribution	1	07/03/2026		TLM1	CO4	T1,T2	
7.	Estimation using χ^2 distribution	1	09/03/2026		TLM1	CO4	T1,T2	
8.	Estimation using F-distributions	1	11/03/2026		TLM1	CO4	T1,T2	
9.	TUTORIAL - IV	1	12/03/2026		TLM3			
No. of classes required to complete UNIT-IV		09			No. of classes taken:			

UNIT-V: Tests of Hypothesis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Testing of Hypothesis definitions	1	16/03/2026		TLM1	CO5	T1,T2	

2.	Z-test for means	1	18/03/2026		TLM1	CO5	T1,T2	
3.	Z-test for proportions	1	23/03/2026		TLM1	CO5	T1,T2	
4.	Z-test for proportions	1	25/03/2026		TLM1	CO5	T1,T2	
5.	t-test for means	1	28/03/2026		TLM1	CO5	T1,T2	
6.	F-test for variances	1	30/03/2026		TLM1	CO5	T1,T2	
7.	χ^2-test for goodness of fit	1	01/04/2026		TLM1	CO5	T1,T2	
8.	χ^2-test for independence of attributes	1	02/04/2026		TLM1	CO5	T1,T2	
9.	TUTORIAL - V	1	04/04/2026		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		09			No. of classes taken:			

II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/ Swayam Prabha/ MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess

	societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. K.R. Kavitha	**Dr. D. Vijay Kumar**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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iodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. K Venkatrao
Course Name & Code : Operating Systems -23CS06
L-T-P Structure : **3-1-0** **Credits:** 3
Program/Sem/Sec : II B.tech/IV-sem/A-Sec **A.Y.:** 2025-26

PREREQUISITE: Knowledge of Computer fundamentals & Data structures & algorithms

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of the course is to make student:

- Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection
- Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock-handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**2**	**1**	**1**												
CO2	**1**	**2**	**2**										**1**		
CO3	**2**	**3**	**1**	**2**								**2**	**1**		
CO4	**2**	**2**	**1**	**1**							**1**			**1**	
CO5	**1**	**2**	**2**									**2**			**1**
1 - Low				**2** –Medium								**3 -** High			

TEXT BOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4 th Edition, Pearson , 2016

Reference Books:

1. Operating Systems -Internals and Design Principles, Stallings W, 9 th edition, Pearson, 2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGrawHill, 2013

Online Learning Resources:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	02-12-2025		TLM2	
2.	operating system functions, operating systems operations	1	03-12-2025		TLM2	
3.	Computing environments	1	05-12-2025		TLM2	
4.	Free and Open-Source Operating Systems	1	06-12-2025		TLM2	
5.	System Structures: Operating System Services	1	06-12-2025		TLM2	
6.	System programs, System calls	1	09-12-2025		TLM2	
7.	Types of System Calls, system programs	1	10-12-2025		TLM2	
8.	operating system Design and Implementation	1	12-12-2025			
9.	Building and Booting an Operating System	1	13-12-2025		TLM2	
10.	Operating system debugging	1	16-12-2025		TLM2	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Processes: Process Concept,	1	17-12-2025		TLM2	
12.	Process scheduling	2	19-12-2025 & 20-12-2025		TLM2	

13.	Operations on processes	1	23-12-2025		TLM2	
14.	Inter-process communication systems	1	24-12-2025		TLM2	
15.	Threads and Concurrency: Multithreading models	2	26-12-2025 & 27-12-2025		TLM2	
16.	Thread libraries and Thread issues	1	30-12-2025		TLM2	
17.	CPU Scheduling: Basic concepts	1	31-12-2025		TLM2	
18.	Scheduling Criteria	1	02-1-2026		TLM2	
19.	Scheduling algorithms	1	03-1-2026		TLM2	
20.	Multiple processor scheduling	1	06-1-2026		TLM2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Synchronization Tools

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Synchronization Tools: The Critical section problem, Peterson's solutions	1	07-1-2026		TLM1	
22.	Mutex Locks	1	09-1-2026		TLM1	
23.	Semaphores	1	10-1-2026		TLM1	
24.	Monitors	1	20-1-2026		TLM1	
25.	Classic problems of Synchronization	1	21-1-2026		TLM1	
26.	Synchronization examples	1	23-1-2026		TLM1	
27.	Deadlocks: System model and deadlock characterization	1	24-1-2026		TLM1	
28.	Methods for Handling deadlocks and deadlock prevention	1	03-02-2026		TLM1	
29.	Deadlock Avoidance	1	04-02-2026		TLM1	
30.	Deadlock detection	1	06-02-2026		TLM1	
31.	Recovery from deadlock	1	07-02-2026		TLM1	
No. of classes required to complete UNIT-III: 11						

UNIT-IV: Memory management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Memory-Management Strategies: Introduction	1	10-02-2026		TLM1	
33.	Contiguous Memory Allocation	1	11-02-2026		TLM1	

34.	Paging and structure of a page table	1	13-02-2026		TLM1	
35.	Swapping	1	14-02-2026		TLM1	
36.	Virtual Memory Management: Introduction, Demand paging and Copy-on-write	1	17-02-2026		TLM1	
37.	Page replacement	1	18-02-2026		TLM1	
38.	Allocation of frames	1	20-02-2026		TLM1	
39.	Thrashing	1	21-02-2026		TLM1	
40.	Storage Management: Overview of Mass Storage Structure	1	24-2-2026		TLM1	
41.	HDD Scheduling	1	25-02-2026		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	File System: File System Interface: File concept, Access methods and Directory Structure	1	27-02-2026		TLM2	
43.	File system Implementation: File-system structure	1	28-02-2026		TLM2	
44.	File-system Operations	1	03-03-2026		TLM2	
45.	Allocation method, Free space management	1	06-03-2026		TLM2	
46.	File-System Internals: File-System Mounting	1	07-03-2026		TLM2	
47.	Partitions and Mounting and File Sharing	1	10-03-2026		TLM2	
48.	Protection: Goals of protection	1	11-03-2026		TLM2	
49.	Principles of protection	1	13-03-2026		TLM2	
50.	Protection Rings	1	14-03-2026		TLM2	
51.	Domain of protection and Access matrix	1	18-03-2026		TLM2	
52.	Revision Unit_V	2	24-03-2026 & 25-03-2026		TLM2	
53.	Revision Unit_I & II	2	27-03-2026 & 28-03-2026		TLM2	
54.	Revision Unit_III&IV	2	01-04-2026 & 04-04-2026		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Units-III, IV & V)	A2=5
II- Descriptive Examination (UNITS-III, IV & V)	M2=15
II-Quiz Examination (UNITS-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web application and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. K. Venkatrao**	**Dr. CH. Venkata Narayana**	**Dr. D. Venkata Subbaiah**	**Dr. S. Nagarjuna Reddy**
Signature				

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
hodcse@Lbrce.ac.in, cseLbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Srinivasa Rao Mekala
Course Name & Code : Database Management Systems (23CS03)
L-T-P Structure : 3-0-0 Credits: 3
Program/Sem/Sec : B.Tech. – CSE / IV Sem / A A.Y. : 2025-26

PRE-REQUISITE: DATA STRUCTURES

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): After successful completion of the course the students are able to

CO1	Understand the foundation of database management system and various data models. **(Understand- L2)**
CO2	Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. **(Understand-L2)**
CO3	Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. **(Apply-L3)**
CO4	Apply various normalization techniques for efficient data handling. **(Apply-L3)**
CO5	Understand Transaction management, recovery & indexing techniques. **(Understand-L2)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO 2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO 3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO 4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO 5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low						**2** –Medium						**3 -** High			

TEXTBOOKS:

T1	Database Management Systems, 3rd edition, Raghu Rama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan, TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, Ramez Elmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

NPTEL Course :

Introduction to Database Systems,: https://nptel.ac.in/courses/106106220

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Database System characteristics	1	2-12-2025		TLM1,2	
2.	Tutorial-1	1	3-12-2025		TLM3	
3.	Database Users	1	5-12-2025		TLM1,2	
4.	Database applications and Advantages	1	6-12-2025		TLM1,2	
5.	Data Models	1	9-12-2025		TLM1,2	
6.	Tutorial-2	1	10-12-2025		TLM3	
7.	Schema	1	12-12-2025		TLM1,2	
8	Three tier schema architecture	2	13-12-2025 16-12-2025		TLM1,2	
9	Tutorial-3	1	17-12-2025		TLM3	
10	Database structure	1	19-12-2025		TLM1,2	
11	Client server architecture	1	20-12-2025		TLM1,2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Entity Relationship Model and Relational Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to ER diagram	1	23-12-2025		TLM1,2	
2.	Tutorial-4	1	24-12-2025		TLM3	
3.	Attributes, Entity set, Relationship,	1	26-12-2025		TLM1,2	
4.	Generalization using ER Diagrams	1	27-12-2026		TLM1,2	
5.	Tutorial-5	1	30-12-2025		TLM3	
6.	Introduction to relational model	1	31-12-2025		TLM1,2	
7	Concepts of domain, attribute, tuple, relation,	1	02-01-2026		TLM1,2	
8	Key Constraints	1	03-01-2026		TLM1,2	
9	Relational Algebra	1	06-01-2026		TLM1,2	
10	Tutorial-6	1	07-01-2026		TLM3	
11	Relational Calculus	1	09-01-2026		TLM1,2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-III: SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	BASIC SQL: Simple Database schema, data types, table definitions	1	20-01-2026		TLM1,2	
2.	Tutorial-7	1	21-01-2026		TLM3	
3.	SQL querying	2	23-01-2026 24-01-2026		TLM1,2	
4.	SQL functions	1	03-02-2026		TLM1,2	
5.	Tutorial-8	1	04-02-2026		TLM3	
6.	key and integrity constraints	1	06-02-2026		TLM1,2	
7.	Nested queries, sub queries, aggregation,	2	07-02-2026 10-02-2026		TLM1,2	
8.	Tutorial-9	1	11-02-2026		TLM3	
9.	Joins	2	13-02-2026 17-02-2026		TLM1,2	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Tutorial-10	1	18-02-2026		TLM3	
2.	Concept of functional dependency	2	20-02-2026 21-02-2026		TLM1,2	
3.	1NF, 2NF	1	24-02-2026		TLM1,2	
4.	Tutorial-11	1	25-02-2026		TLM3	
5.	3NF and BCNF	2	27-02-2026 28-02-2026		TLM1,2	
6.	Tutorial-12	1	04-03-2026		TLM3	
7.	MVD, Fourth normal form(4NF)	1	06-03-2026		TLM1,2	
8.	Fifth Normal Form (5NF)	2	07-03-2026 10-03-2026		TLM1,2	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Transaction Processing and Concurrency Control

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Tutorial-13	1	11-03-2026		TLM3	
2.	Transaction State, ACID properties	1	13-03-2026		TLM1,2	
3.	Concurrent Executions, Serializability, Recoverability	1	17-03-2026		TLM1,2	
4.	Tutorial-14	1	18-03-2026		TLM3	
5.	Implementation of Isolation	1	20-03-2026		TLM1,2	
6.	Concurrency control	1	24-03-2026		TLM1,2	
7.	Tutorial-15	1	25-03-2026		TLM3	
8.	Transaction recovery Shadow Paging, ARIES	1	28-03-2026		TLM1,2	
9.	Hash based Indexing	1	31-03-2026		TLM1,2	
10.	Tutorial-16	1	01-04-2026		TLM3	
11.	Hash based Indexing	1	04-04-2026		TLM1,2	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignmenton Cycle – I(Units-I, II)	A1=5
MID – IDescriptiveExamination (Units-I, II)	M1=15
MID – I Objective /QuizExamination (Units-I, II)	Q1=10
Mid – I Total Marks: A1 + M1 + Q1	MT1 = 30
Assignment on Cycle – II(Unit-III, IV & V)	A2=5
MID – II Descriptive Examination (UNIT-III, IV & V)	M2=15
MID – II Objective / Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid – II Total Marks: A2 + M2 + Q2	MT2 = 30
ContinuousInternal Evaluation (CIE): 80% of Max (MT1, MT2) + 20% of Min (MT1, MT2)	C = 30
Semester End Examination (SEE): S	S = 70
Total Marks (T) = C + S	T = 100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	**The ability to apply Software Engineering practices and strategies in software project developme open-source programming environment for the success of organization.**
PSO2	**The ability to design and develop computer programs in networking, web applications and IoT as society needs.**
PSO3	**To inculcate an ability to analyze, design and implement database applications.**

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. M. Srinivasa Rao**	**Dr. M. Srinivasa Rao**	**Dr. Y.V. Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.Veera Swamy
Course Name & Code : SOFTWARE ENGINEERING & 23IT02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM /A **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3	-	2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering	1	1/12/2025		TLM1, 2	
2.	Evolving role of Software	1	3/12/2025		TLM1, 2	
3.	Software Development projects	1	4/12/2025		TLM1, 2	
4.	Exploratory style of software developments .	1	6/12/2025		TLM1, 2	
5.	Emergence of software engineering	1	8/12/2025		TLM1, 2	
6.	Notable changes in software development practices,	1	10/12/2025		TLM1, 2	
7.	Computer system engineering. Software Life Cycle Models.	1	11/12/2025		TLM1, 2	
8.	Software Life Cycle Models. Basic concepts	1	13/12/2025		TLM1, 2	
9.	Waterfall model and its extensions.	1	15/12/2025		TLM1, 2	
10.	Rapid application development Agile development model.	1	17/12/2025		TLM1, 2	
11.	Agile development model	1	18/12/2025		TLM1, 2	
12.	Spiral Model.	1	20/12/2025		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

13.	Software project management complexities	1	22/12/2025		TLM1,2	
14.	Responsibilities of a software project manager	1	24/12/2025		TLM1,2	
15.	Metrics for project size estimation Project estimation techniques	2	27/12/2025		TLM1,2	
16.	Empirical Estimation techniques, COCOMO	2	29/12/2025		TLM1,2	
17.	Halstead's software science, risk management.	1	31/12/2025		TLM1,2	
18.	Requirements Analysis and Specification	2	3/01/2026		TLM1,2	
19.	Software Requirements Specification (SRS)	1	5/01/2026		TLM1,2	
20.	Axiomatic specification, Algebraic specification	1	7/01/2026		TLM1,2	
21.	Executable specification and 4GL.	1	8/01/2026		TLM1,2	
22.	Tutorial	1	10/01/2026		TLM1,2	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Software Design Overview of the design process	1	19/01/2026		TLM1,2	
24.	How to characterize a good software design?	1	21/01/2026		TLM1,2	
25.	Layered arrangement of modules, Cohesion and Coupling	1	22/01/2026		TLM1,2	
26.	Approaches to software design	1	24/01/2026		TLM1,2	
27.	Agility and the Cost of Change, Agile Process	1	2/02/2026		TLM1,2	
28.	Extreme Programming (XP), Other Agile Process Models	1	4/02/2026		TLM1,2	
29.	Tool Set for the Agile Process	1	5/02/2026		TLM1,2	
30.	Function-Oriented Software Design: Overview of SA/SD methodology	1	7/02/2026		TLM1,2	
31.	Structured analysis, Developing the DFD model of a system	1	9/02/2026		TLM1,2	
32.	Structured design, Detailed design, and Design Review	1	11/02/2026		TLM1,2	
33.	User Interface Design: Characteristics of a good user interface	1	12/02/2026		TLM1,2	
34.	Basic concepts, Types of user interfaces	1	14/02/2026		TLM1,2	
35.	Fundamentals of component-based GUI development	1	16/02/2026		TLM1,2	
36.	user interface design methodology.	1	18/02/2026		TLM1,2	
37.	Tutorial	1	19/02/2026			
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Coding, Code review	1	21/02/2026		TLM1,2	
39.	Software documentation, Testing.	1	23/02/2026		TLM1,2	
40.	Black-box testing	1	25/02/2026		TLM1,2	
41.	White-Box testing	1	26/02/2026		TLM1,2	
42.	Debugging, Program analysis tools	1	28/02/2026		TLM1,2	
43.	Integration testing	1	2/03/2026		TLM1,2	
44.	Testing object-oriented programs	1	4/03/2026		TLM1,2	
45.	Smoke testing, and some general issues associated with testing.	1	5/03/2026		TLM1,2	
46.	Software Reliability and Quality Management: Software reliability	1	7/03/2026		TLM1,2	
47.	Software quality management system	1	9/03/2026		TLM1,2	
48.	ISO 9000.SEI Capability maturity model	1	11/03/2026		TLM1,2	
49.	Few other important quality standards, and Six Sigma.	1	12/03/2026		TLM1,2	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Introduction Computer-Aided Software Engineering (CASE), CASE and its scopes	1	14/03/2026		TLM1,2	
51.	CASE environment	1	16/03/2026		TLM1,2	
52.	CASE support in the software life cycle. CASE support in the software life cycle	1	18/03/2026		TLM1,2	
53.	CASE support in the software life cycle, other characteristics of CASE tools	1	21/03/2026		TLM1,2	
54.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	23/03/2026		TLM1,2	
55.	Software Maintenance: Characteristics of software maintenance	1	25/03/2026		TLM1,2	
56.	. Software reverse engineering	1	28/03/2026		TLM1,2	
57.	Software maintenance process models and	1	30/03/2026		TLM1,2	

	Estimation of maintenance cost.					
58.	Software Reuse: reuse-definition, Introduction, Reason behind no reuse so far	1	1/04/2026		TLM1,2	
59.	Basic issues in any reuse program	1	2/04/2026		TLM1,2	
60.	A reuse approach and Reuse at organization level.	1	4/04/2026		TLM1,2	
61.	ASSIGNMENT-5	1			TLM3	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	28/03/25		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.p.veera Swamy**	**Dr. J. Nageswara Rao**	**Dr. Y. Vijaya Bhaskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., IV-Sem., CSE-A
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE : 2-0-0
COURSE CREDITS : 0
COURSE INSTRUCTOR : Dr. Shaheda Niloufer
COURSE COORDINATOR : Dr. Shaheda Niloufer
PRE-REQUISITES : Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	01-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	05-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	08-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	12-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	15-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	19-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	22-12-2025					
No. of classes required to complete UNIT-I		06			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	26-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	29-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids	1	02-01-2026		TLM1	CO2	T1,T2	
11.	Types of ecosystems	1	05-01-2026		TLM1	CO2	T1,T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	09-01-2026		TLM1	CO2	T1,T2	
13.	Values of Biodiversity, India as mega diversity nation	1	16-01-2026		TLM1	CO2	T1,T2	

14.	Threats to biodiversity and Conservation of biodiversity	1	19-01-2026		TLM1	CO2	T1,T2	
15.	Revision	1	23-01-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
16.	Environmental pollution -Air pollution	1	02-02-2026		TLM1	CO3	T1,T2	
17.	Water pollution, Marine pollution, Thermal pollution	1	06-02-2026		TLM1	CO3	T1,T2	
18.	Soil pollution	1	09-02-2026		TLM1	CO3	T1,T2	
19.	Noise pollution & Nuclear Hazards	1	13-02-2026		TLM1	CO3	T1,T2	
20.	Solid waste management	1	16-02-2026		TLM1	CO3	T1,T2	
21.	Disaster management	1	20-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
22.	From Unsustainable to Sustainable development	1	23-02-2026		TLM1	CO4	T1,T2	
23.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	27-02-2026		TLM1	CO4	T1,T2	
24.	Environmental ethics, Climate change	1	02-03-2026		TLM1	CO4	T1,T2	
25.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	06-03-2026		TLM1	CO4	T1,T2	
26.	Environmental Acts	1	09-03-2026		TLM1	CO4	T1,T2	
27.	Environmental Acts	1	13-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	16-03-2026		TLM1	CO5	T1,T2	
29.	Environment and human health –Human Rights – Value Education	1	20-03-2026		TLM1	CO5	T1,T2	
30.	HIV/AIDS – Women and Child Welfare	1	23-03-2026		TLM1	CO5	T1,T2	
31.	Role of information Technology in Environment and human health	1	27-03-2026		TLM1	CO5	T1,T2	
32.	Revision	1	30-03-2026		TLM3	CO5	T1,T2	
33.	Revision	1	03-04-2026		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		06			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Case studies	2	23-01-2026 20-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. K Venkatrao
Course Name & Code : OPERATING SYSTEMS Lab & 20CS55
L-T-P Structure : 0-0-3 **Credits:1.5**
Program/Sem/Sec : B.Tech. - CSE/IV/A **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation
- Implement Bankers Algorithms to Avoid the Dead Lock
- acquire the generic software development skill through various stages of software life cycle
- generate test cases for software testing

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the pthreads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 - Low			**2 –**Medium								**3 -** High				

REFERENCE BOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
3. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
4. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGrawHill, 2013

Online Learning Resources:
1. https://www.cse.iitb.ac.in/~mythili/os/
2. http://peterindia.net/OperatingSystems.html
3. www.cs.washington.edu/~tom/nachos

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	3	04/12/2025		**DM5**	
2.	Lab Cycle-1	3	11/12/2025		**DM5**	
3.	Lab Cycle -2	3	18/12/2025		**DM5**	
4.	Lab Cycle-3	6	01/1/2026, 08/1/2026		**DM5**	
5.	Lab Cycle-4	3	06/01/2026		**DM5**	
6.	Lab Cycle-5	3	22/01/2026		**DM5**	
7.	Lab Cycle-6	3	29/01/2026		**DM5**	
8.	Lab Cycle-7	3	05/02/2026		**DM5**	
9.	Lab Cycle-8	3	12/02/2026		**DM5**	
10.	Lab Cycle9	3	19/02/2026		**DM5**	
11.	Lab Cycle10	3	26/02/2026		**DM5**	
12.	Lab Cycle11	3	05/03/2026		**DM5**	
13.	Lab Cycle12	3	12/03/2026		**DM5**	
14.	Practice Lab		19/03/2026		**DM5**	
15.	Internal Lab Exam	3	26/03/2026			

Teaching Learning Methods			
DM1	Chalk and talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Day-to-day work	A1 = 05
Record	A2 = 05
Internal test	A3 = 05
CIE Total: (A1+A2+A3)	**M1 = 15**
Procedure/Algorithm	B1 = 5
Experimentation/Program execution	B2 = 10
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 5
Viva voce	B5 = 5
SEE Total: (B1+B2+B3+B4+B5)	**M2 = 35**
Total Marks = CIE + SEE = (M1+M2)	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. K Venkatrao**	**Dr. Ch. Venkata Narayana**	**Dr. D. Venkata Subbaiah**	**Dr. S. Nagarjuna Reddy**
Signature				

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hodcse@Lbrce.ac.in, cseLbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr. Srinivasa Rao Mekala
Course Name & Code : Database Management Systems Lab (23CS56)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech. – CSE / IV Sem / A A.Y. : 2025-26

Pre-Requisites : Data Structures and Operating Systems

COURSE EDUCATIONAL OBJECTIVES (CEOs):: This Course will enable students to

1. Populate and query a database using SQL DDL/DML Commands

2. Declare and enforce integrity constraints on a database

3. Writing Queries using advanced concepts of SQL

4. Programming PL/SQL including procedures, functions, cursors and triggers

COURSE OUTCOMES (COs): At the end of the course, students can

CO 1	Implement SQL queries using DDL/DML commands.(Apply-L3)
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. (Apply-L3)
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. .(Apply-L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO 2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO 3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
C04	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Creation, altering and dropping of tables and inserting rows into a table	6	03-12-2025 10-12-2025		TLM4	
2	Queries (along with sub-Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.	6	17-12-2025 24-12-2025		TLM4	
3	Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views	3	31-12-2025		TLM4	
4	Queries using Conversion functions, string functions date functions	3	07-01-2026		TLM4	
5	Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section	3	21-01-2026		TLM4	
6	Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block	3	04-02-2026		TLM4	
7	Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions	3	11-02-2026		TLM4	
8	Program development using Loops and ERROR Handling	3	18-02-2026		TLM4	

9	Programs development using creation of procedures,	3	25-02-2026		TLM4	
10	Program development using creation of stored functions	3	11-03-2026		TLM4	
11	Develop programs using features parameters in a CURSOR	3	18-03-2026		TLM4	
12	Develop Programs using Triggers	3	25-03-2026		TLM4	
13	Internal Lab exam		01-04-2026		TLM4	

Delivery Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	**The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organiz**
PSO2	**The ability to design and develop computer programs in networking, web application IoT as per the society needs.**
PSO3	**To inculcate an ability to analyze, design and implement database applications.**

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. M. Srinivasa Rao**	**Dr. M. Srinivasa Rao**	**Dr. Y.V. Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

PROGRAM	**: B. TECH-CSE**-IV-Sem-A Sec
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**: FULL STACK DEVELOPMENT-1 & 23CSS2**
L-T-P STRUCTURE	**: 0-1-2**
COURSE CREDITS	**: 2**
COURSE INSTRUCTOR	**: Mr.P. NAGABABU**
COURSE COORDINATOR	**: Dr. S. Nagarjuna Reddy**

PREREQUISITE: NILL

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Main objectives of the Course are to

- Make use of HTML Elements and their attributes for Designing static web pages
- Build a Web page by applying appropriate CSS style to HTML elements
- Experiment with JavaScript to Develop Dynamic Web pages and validate forms

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Design static web pages by using HTML elements. **(Apply-L3)**
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. **(Apply-L3)**
CO3	Develop dynamic web pages and validate forms using JavaScript. **(Apply-L3)**
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		2		2							2	3	3	
CO2	1		2		2							2	3	3	
CO3	1		2		2							2	3	3	
CO4								2	2	2					
1 - Low			**2 –**Medium						**3 –**High						

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Lists, Links and Images	03	2-12-2025		
2.	HTML Tables, Forms and Frames	03	16-12-2025&23-12-2025		
3.	HTML 5 and Cascading Style Sheets, Types of CSS	03	30-12-2025&06-01-2026		
4.	Selector forms	03	13-01-2026&20-01-2026		
5.	CSS with Color, Background, Font, Text and CSS Box Model	03	03-02-2026 &10-02-2026		
6.	Applying JavaScript - internal and external, I/O, Type Conversion	03	17-02-2026&24-02-2026		
7.	Java Script Pre - defined and User-defined Objects	03	03-03-2026&10-03-2026		
8.	Java Script Conditional Statements and Loops	03	17-03-2026		
9.	Java Script Functions and Events	03	24-03-2026		
10.	Internal Exam	03	31-03-2026		

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
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PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mr.P.Nagababu	Dr. S. Nagarjuna Reddy	Dr.Y.Vijay Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.J.NAGESWARA RAO ,
Regulation : R23
L-T-P Structure **:** 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – A- Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
• Bring awareness on innovative design and new product development.
• Explain the basics of design thinking.
• Familiarize the role of reverse engineering in product development.
• Train how to identify the needs of society and convert into demand.
• Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:
1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. IdrisMootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:
1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:
• https://nptel.ac.in/courses/110/106/110106124/
• https://nptel.ac.in/courses/109/104/109104109/
• https://swayam.gov.in/nd1_noc19_mg60/preview
• https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Saturday (from 9.00 AM – 12.00 PM)

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–IIntroduction to Design Thinking,** Introduction to elements and principles of Design, basics of design-dot, line, shape, form asfundamental design components	3	05-12-2025		TLM2/ TLM4	
02	Principles of design	3	12-12-2025		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	19-12-2025		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	26-12-2026		TLM1	
05	Design thinking in social innovations. Tools of	3	02-01-2026		TLM2	

	design thinking - person, costumer					
06	journey map, brainstorming, product development (Activity)	3	09-01-2026		TLM4/ TLM6	
I Mid Exams: 26-01-2026 to31-01-2026						
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	06-02-2026		TLM1/ TLM4/ TLM6	
08	Creativity to Innovation. Teams for innovation, Measuring theimpact and value of creativity.	3	13-02-2026		TLM2/ TLM4/ TLM6	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	20-02-2026		TLM4/ TLM6	
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	27-02-2025		TLM1/ TLM4/ TLM6	
11	Product planning, product specifications. Innovation towards product design Case studies.	3	06-03-2026		TLM2/ TLM6	
12	**Activity:** Importance of modeling, how to set specifications,Explaining their own product design	3	13-03-2026		TLM4/ TLM6	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	20-03-2026		TLM2/ TLM4/ TLM6	
14	Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme					

	competition, Standardization					
15	Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.	3	27-03-2026		TLM4/ TLM6	
16	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.					
II Mid Exams: 06-04-2026 to 11-04-2026						
No. of classes required to complete: 48				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-B

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Name of the Faculty	Dr.J.NAGESWARA RAO	Dr.K DeviPriya	Dr.Y.Vijaya Bhaskar Reddy	Dr.S.Nagarjuna Reddy
Designation	**Course Instructors**	**Course Coordinator**	**Module Coordinator**	**HoD**

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An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.U. RAMBABU
Course Name & Code : Managerial Economics and Financial Analysis & 23HS02
L-T-P Structure : 2-0-0 **Credits:** 2
Program/Sem/Sec : B.Tech/CSE/IV /B **A.Y.:** 2025-26

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES(CEO):

To inculcate the basic knowledge of microeconomics and financial accounting
To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
To Know the Various types of market structure and pricing methods and strategy
To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
To provide fundamental skills in accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, students will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	–	–	–	–	2	–	1	–	–	–
CO2	3	2	2	1	1	–	–	–	–	2	–	1	–	–	–
CO3	3	2	1	1	1	1	1	–	2	3	–	1	–	–	–
CO4	3	2	2	1	1	–	–	–	1	2	2	1	–	–	–
CO5	3	2	2	1	2	–	–	–	1	3	2	1	–	–	–

1 - Low **2 –**Medium **3 -** High

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt https://www.slideshare.net/rossanz/production-and-cost-45827016 https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):SEC-B

UNIT-I: Introduction to Managerial Economics:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	01-12-2025		TLM2	
2.	Economics-Managerial Economics	1	02-12-2025		TLM2	
3.	Nature and Scope.	1	03-12-2025		TLM2	
4.	Demand	1	08-12-2025		TLM2	
5.	Law of demand-	1	09-12-2025		TLM2	
6.	Elasticity of demand	1	10-12-2025		TLM2	
7.	Types of Elasticity of demand	2	15-12-2025 16-12-2025		TLM1/TLM2	
8.	Demand Forecasting -Methods.	2	17-12-2025 22-12-2025		TLM2	
9.	Unit-1 Revision	1	23-12-2025		TLM2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Theory of Production and Cost analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Production Function	2	24-12-2025 29-12-2025		TLM2	
11.	Isoquant and Isocost	2	30-12-2025 31-12-2025		TLM1/TLM2	
12.	Least Cost Combination of inputs	1	05-01-2026		TLM2	
13.	Law of Returns	1	06-01-2026		TLM2	
14.	Internal and External Economies of Scale.	2	07-01-2026 12-01-2026		TLM2	
15.	Cost Concepts	1	13-01-2026		TLM2	
16.	Break-even Analysis	3	14-01-2026 19-01-2026 20-01-2026		TLM1	
17.	Unit -2 Revision	1	21-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		
I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)						

UNIT-III: Markets & Pricing Policies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Market structures: Markets-Types of markets	1	02-02-2026		TLM2	
19.	Features	2	03-02-2026		TLM2	
20.	price out determinations under Perfect competition	1	04-02-2026		TLM2	
21.	Monopoly, Monopolistic Competition	2	09-02-2026 10-02-2026		TLM2	
22.	Pricing –Pricing polices & its Objectives	1	11-02-2026		TLM2	
23.	Pricing Methods and its applications in business.	1	16-02-2026		TLM2	
24.	Unit 3 Revision	1	17-02-2026		TLM2	
No. of classes required to complete UNIT-III: 9				**No. of classes taken:**		

UNIT-IV: Unit -IV Capital and Capital Budgeting:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Nature and its significance,	1	18-02-2026		TLM1	
26.	Types of Capital	1	23-02-2026		TLM2	
27.	Sources of raising capital	1	24-02-2026		TLM2	
28.	Capital budgeting-Significance & Process	1	25-02-2026		TLM2	
29.	Techniques of Capital Budgeting (Non-Discounted)	2	02-03-2026 03-03-2026		TLM1	
30.	Techniques of Capital Budgeting (Discounted)	2	04-03-2026 09-03-2026		TLM1	
31.	Unit-4 Revision	1	10-03-2026		TLM2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Financial Accounting and analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Accounting –significance -	2	11-03-2026 16-03-2026		TLM2	
33.	Bookkeeping-Double entry system	1	17-03-2026		TLM2	
34.	Journal	1	18-03-2026		TLM1	
35.	Ledger	1	23-03-2026		TLM1	
36.	Trial Balance	1	24-03-2026		TLM1	
37.	Final Accounts with simple adjustments	1	25-03-2026		TLM1	
38.	Financial Statement Analysis through ratios.	2	30-03-2026 31-03-2026		TLM1	
No. of classes required to complete UNIT-V: 9				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Stock Market Essentials: Knowledge for Tomorrow's Leaders	1	01-04-2026		TLM2			
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5

I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III ,IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III ,IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.U. RAMBABU**	**Dr. A. ADISESHA REDDY**	**Dr. A. ADISESHA REDDY**	**Dr.S.Nagarjuna Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE-B
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Mr.B.Tandava Krishna
COURSE COORDINATOR : Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	01/12/2025		TLM1	CO1	T1, T2	
2.	Syllabus Co's, PO's	1	02/12/2025		TLM1	CO1	T1, T2	
3.	Unit-1, Introduction to data science	1	04/12/2025		TLM1	CO1	T1, T2	
4.	Statistics- Population and sample, Collection of data,	1	06/12/2025		TLM1	CO1	T1, T2	
5.	Types of variables	1	08/12/2025		TLM1	CO1	T1, T2	
6.	Data visualization	1	09/12/2025		TLM1	CO1	T1, T2	
7.	Measures of central tendency, A.M	1	11/12/2025		TLM1	CO1	T1, T2	
8.	Median, mode problems	1	13/12/2025		TLM1	CO1	T1, T2	
9.	Measures of variability Range, Mean deviation	1	15/12/2025		TLM1	CO1	T1, T2	
10.	S.D. & Q D	1	16/12/2025		TLM1	CO1	T1, T2	
11.	Tutorial	1	18/12/2025		TLM1	CO1	T1, T2	
12.	Skewness	1	20/12/2025		TLM1	CO1	T1, T2	
13.	Kurtosis	1	22/12/2025		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Correlation, types	1	23/12/2025		TLM1	CO2	T1, T2	
15.	Coefficient of correlation	1	27/12/2025		TLM1	CO2	T1, T2	
16.	Rnak correlation	1	29/12/2025		TLM1	CO2	T1, T2	
17.	Linear regression (lines)	1	30/12/2025		TLM1	CO2	T1, T2	
18.	Problems	1	03/01/2026		TLM1	CO2	T1, T2	
19.	Multiple regression	1	05/01/2026		TLM1	CO2	T1, T2	
20.	Regression coefficients	1	06/01/2026		TLM1	CO2	T1, T2	
21.	Tutorial II	1	08/01/2026		TLM1	CO2	T1, T2	
22.	Properties, problems	1	10/01/2026		TLM1	CO2	T1, T2	
23.	Fitting of parabola	1	17/01/2026		TLM1	CO2	T1, T2	
24.	Exponential curve	1	19/01/2026		TLM1	CO2	T1, T2	
25.	Fitting of power curve	1	20/01/2026		TLM3	CO2	T1, T2	
26.	Tutorial III	1	22/01/2026		TLM1	CO2	T1, T2	
27.	Problems	1	24/01/2026		TLM1	CO2	T1, T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Probability, Introduction	1	02/02/2026		TLM1	CO3	T1, T2	
29.	Conditional probability	1	03/02/2026		TLM1	CO3	T1, T2	
30.	Bayes theorem	1	05/02/2026		TLM3	CO3	T1, T2	
31.	Problems	1	07/02/2026		TLM1	CO3	T1, T2	
32.	Random variables, Distribution function	1	09/02/2026		TLM1	CO3	T1, T2	
33.	Probability mass function	1	10/02/2026		TLM1	CO3	T1, T2	
34.	Probability density function	1	12/02/2026		TLM1	CO3	T1, T2	
35.	Mathematical expectation, variance	1	14/02/2026		TLM3	CO3	T1, T2	
36.	Binomial distribution	1	16/02/2026		TLM1	CO3	T1, T2	
37.	Poisson distribution	1	17/02/2026		TLM1	CO3	T1, T2	
38.	Normal distribution	1	19/02/2026		TLM1	CO3	T1, T2	
39.	Uniform distribution	1	21/02/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Sampling Distribution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction: population & sample Sampling distribution	1	23/02/2026		TLM1	CO4	T1, T2	
41.	Sampling distribution of means & variance	1	24/02/2026		TLM1	CO4	T1, T2	
42.	problems	1	26/02/2026		TLM1	CO4	T1, T2	
43.	Central limit theorem	1	28/02/2026		TLM3	CO4	T1, T2	
44.	Estimation- point & interval, maximum error	1	02/03/2026		TLM1	CO4	T1, T2	
45.	Estimation using t-distribution	1	05/03/2026		TLM1	CO4	T1, T2	
46.	problems	1	07/03/2026		TLM3	CO4	T1, T2	
47.	Estimation using F-distribution	1	09/03/2026		TLM1	CO4	T1, T2	
48.	Estimation using χ^2 −distribution	1	10/03/2026		TLM1	CO4	T1, T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Test of Hypothesis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Hypothesis: introduction, Definitions	1	12/03/2026		TLM1	CO5	T1, T2	

50.	Z-test for single mean	1	14/03/2026		TLM1	CO5	T1, T2	
51.	Z-test for diff. of mean	1	16/03/2026		TLM3	CO5	T1, T2	
52.	Z-test for single proportion	1	17/03/2026		TLM1	CO5	T1, T2	
53.	Z-test for difference of proportion	1	23/03/2026		TLM1	CO5	T1, T2	
54.	t-test for single mean	1	24/03/2026		TLM1	CO5	T1, T2	
55.	t-test for diff. means,	1	28/03/2026		TLM1	CO5	T1, T2	
56.	F-test for variances	1	30/03/2026		TLM1	CO5	T1, T2	
57.	χ^2 −test for goodness of fit	1	31/03/2026		TLM1	CO5	T1, T2	
58.	χ^2 −test for independence	1	04/04/2026		TLM1	CO5	T1, T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
59.	Paired t-test	1	28/03/2026		TLM1	CO5	T1, T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B.Tandava Krishna	**Dr. D. Vijay Kumar**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. SunilKumar Ketineni
Course Name & Code:-OPERATING SYSTEMS Lab&23CS55
L-T-P Structure :0-0-3 **Credits:1.5**
Program/Sem/Sec : II B.TECH-CSE/IV/B-sec **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course are to • Provide insights into system calls, file systems, semaphores,

• Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation

• Implement Bankers Algorithms to Avoid the Dead Lock

• acquire the generic software development skill through various stages of software life cycle

• generate test cases for software testing

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the threads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	3	-	-	-	-	-	-	-	3	3	-
CO2	1	1	1	2	2	-	-	-	-	-	-	-	3	3	2
CO3	2	1	1	2	1	-	-	-	-	-	-	-	3	3	3
CO4	-	-	-	-	-	-	-	2	2	3	-	-	-	-	-
1 - Low **2 –**Medium **3 -** High															

REFERENCE BOOKS:

R1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
R2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
R3	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R4	

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	3	04-12-2025		**DM5**	
2.	Lab Cycle-2	3	11-12-2025		**DM5**	
3.	Lab Cycle -3	3	18-12-2025		**DM5**	
4.	Lab Cycle-4	3	01-01-2026		**DM5**	
5.	Lab Cycle-5	3	08-01-2026		**DM5**	
6.	Lab Cycle-6	3	15-01-2026		**DM5**	
7.	Lab Cycle-7	3	22-01-2026		**DM5**	
8.	Lab Cycle-8	3	05-02-2026		**DM5**	
9.	Lab Cycle-9	3	12-02-2026		**DM5**	
10.	Lab Cycle-10	3	19-02-2026		**DM5**	
11.	Lab Cycle-11	3	05-03-2026		**DM5**	
12.	Lab Cycle -12	3	05-03-2026		**DM5**	
13.	Lab Cycle-13	3	12-03-2026		**DM5**	
14.	Lab Cycle-13	3	12-03-2026		**DM5**	
15.	Internal exam	3	02-04-2026			

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. SunilKumar Ketineni**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. N V NAIK
Course Name & Code : Database Management Systems & 23CS03
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B. Tech/IV/B **A.Y.:** 2025-26
PREREQUISITES : **Data Structures**

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): After successful completion of the course the students are able to

CO1	**Understand the foundation of database management system and various data models. (Understand- L2)**
CO2	**Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand-L2)**
CO3	**Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply-L3)**
CO4	**Apply various normalization techniques for efficient data handling. (Apply-L3)**
CO5	**Understand Transaction management, recovery & indexing techniques. (Understand-L2)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low						**2** –Medium						**3** - High			

TEXTBOOKS:

T1	Database Management Systems, 3rd edition, Raghu Rama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan, TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, Ramez Elmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Database System characteristics	1	02-12-2025		TLM1,2	
2.	Database users	1	03-12-2025		TLM1,2	
3.	Advantages of database systems	1	04-12-2025		TLM1,2	
4.	Tutorial	1	06-12-2025			
5.	Database applications	1	09-12-2025		TLM1,2	
6.	Data Models	1	10-12-2025		TLM1,2	
7.	Schema	1	11-12-2025		TLM1,2	
8.	Tutorial	1	13-12-2025			
9.	Three tier schema architecture	2	16-12-2025 17-12-2025		TLM1,2	
10.	Database structure	1	18-12-2025		TLM1,2	
11.	Tutorial	1	20-12-2025			
11.	Centralized and Client server architecture for the database	2	23-12-2025 24-12-2025		TLM1,2	
12.	Tutorial	1	27-12-2025		TLM3	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Entity Relationship Model and Relational Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	1	30-12-2025		TLM1,2	
2.	Representation of entities	1	31-12-2025		TLM1,2	
3.	Attributes, Entity set, Relationship, Relationship set	1	02-01-2026		TLM1,2	
4.	Tutorial	1	03-01-2026			
5.	Constraints, Sub classes, Super class, Inheritance, Specialization	1	06-01-2026		TLM1,2	
6.	Generalization using ER Diagrams	1	07-01-2026		TLM1,2	
7.	Introduction to relational model	1	08-01-2026		TLM1,2	
8.	Tutorial	1	10-01-2026			
9.	Concepts of domain, attribute, tuple, relation, importance of null values	1	17-01-2026		TLM1,2	
10.	Constraints (Domain, Key constraints, integrity constraints) and their importance	1	20-01-2026		TLM1,2	
11.	Relational Algebra Relational Calculus	2	21-01-2026 22-01-2026		TLM1,2	
12.	Tutorial	1	24-01-2026		TLM3	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update)	1	03-02-2026		TLM1,2	
2.	SQL querying (select and project) using where clause, arithmetic & logical operations	2	04-02-2026 05-02-2026		TLM1,2	
3.	Tutorial	1	07-02-2026			
4.	SQL functions (Date and Time, Numeric, String conversion)	1	10-02-2026		TLM1,2	
5.	Creating tables with relationship, implementation of key and integrity constraints	2	11-02-2026 12-02-2026		TLM1,2	
6.	Tutorial	1	14-02-2026			
7.	Nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.	2	17-02-2026 18-02-2026		TLM1,2	
8.	Tutorial	1	19-02-2026		TLM3	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Purpose of Normalization or schema refinement	1	21-02-2026		TLM1,2	
2.	Concept of functional dependency	1	24-02-2026		TLM1,2	
3.	Normal forms based on functional dependency Lossless join and dependency preserving decomposition	2	25-02-2026 26-02-2026		TLM1,2	
4.	Tutorial	1	28-02-2026			
5.	1NF, 2NF and 3 NF, concept of surrogate key, Boyce- Codd normal form (BCNF)	2	04-03-2026 05-03-2025		TLM1,2	
6.	Tutorial	1	07-03-2026			
7.	MVD, Fourth normal form(4NF)	1	10-03-2026		TLM1,2	
8.	Fifth Normal Form (5NF)	1	11-03-2026		TLM1,2	
9.	Tutorial	1	12-03-2026		TLM3	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Transaction Processing and Concurrency Control

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Transaction State, ACID properties	1	14-03-2026		TLM1,2	
2.	Concurrent Executions, Serializability, Recoverability	2	17-03-2026 18-03-2026		TLM1,2	
3.	Implementation of Isolation, Testing for Serializability	1	24-03-2026		TLM1,2	
4.	Two-Phase Locking Techniques for concurrency control: Types of Locks, Time stamp-based locking	1	25-03-2026		TLM1,2	
5.	Recovery Concepts	1	28-03-2026		TLM1,2	
6.	No-UNDO/REDO Recovery Based on	1	30-03-2026		TLM1,2	

	Deferred Update					
7.	Recovery Techniques Based on Immediate Update	1	31-04-2026		TLM1,2	
8.	Shadow Paging, ARIES	1	11-04-2026		TLM1,2	
9.	Hash based Indexing	1	02-04-2026		TLM1,2	
10.	Tutorial	1	04-04-2026		TLM3	
No. of classes required to complete UNIT-II: 11				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of Organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.N V NAIK**	**Dr. M.Srinivasa Rao**	**Dr. Y V Bhaskar Reddy**	**Dr. S.N.Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.Veera Swamy
Course Name & Code : SOFTWARE ENGINEERING & 23IT02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM /B **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3	-	2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering	1	2/12/2025		TLM1, 2	
2.	Evolving role of Software	1	3/12/2025		TLM1, 2	
3.	Software Development projects	1	5/12/2025		TLM1, 2	
4.	Exploratory style of software developments.	1	6/12/2025		TLM1, 2	
5.	Emergence of software engineering	1	9/12/2025		TLM1, 2	
6.	Notable changes in software development practices,	1	10/12/2025		TLM1, 2	
7.	Computer system engineering. Software Life Cycle Models.	1	12/12/2025		TLM1, 2	
8.	Software Life Cycle Models. Basic concepts	1	13/12/2025		TLM1, 2	
9.	Waterfall model and its extensions.	1	16/12/2025		TLM1, 2	
10.	Rapid application development Agile development model.	1	17/12/2025		TLM1, 2	
11.	Agile development model	1	19/12/2025		TLM1, 2	
12.	Spiral Model.	1	20/12/2025		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

13.	Software project management complexities	1	23/12/2025		TLM1,2	
14.	Responsibilities of a software project manager	1	24/12/2025		TLM1,2	
15.	Metrics for project size estimation Project estimation techniques	2	26/12/2025		TLM1,2	
16.	Empirical Estimation techniques, COCOMO	2	27/12/2025		TLM1,2	
17.	Halstead's software science, risk management.	1	30/12/2025		TLM1,2	
18.	Requirements Analysis and Specification	2	31/12/2026		TLM1,2	
19.	Software Requirements Specification (SRS)	1	2/01/2026		TLM1,2	
20.	Axiomatic specification, Algebraic specification	1	3/01/2026		TLM1,2	
21.	Executable specification and 4GL.	1	6/01/2026		TLM1,2	
22.	Tutorial	1	7/01/2026		TLM1,2	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Software Design Overview of the design process	1	9/01/2026		TLM1,2	
24.	How to characterize a good software design?	1	10/01/2026		TLM1,2	
25.	Layered arrangement of modules, Cohesion and Coupling	1	20/01/2026		TLM1,2	
26.	Approaches to software design	1	21/01/2026		TLM1,2	
27.	Agility and the Cost of Change, Agile Process	1	23/01/2026		TLM1,2	
28.	Extreme Programming (XP), Other Agile Process Models	1	24/01/2026		TLM1,2	
29.	Tool Set for the Agile Process	1	3/02/2026		TLM1,2	
30.	Function-Oriented Software Design: Overview of SA/SD methodology	1	4/02/2026		TLM1,2	
31.	Structured analysis, Developing the DFD model of a system	1	6/02/2026		TLM1,2	
32.	Structured design, Detailed design, and Design Review	1	7/02/2026		TLM1,2	
33.	User Interface Design: Characteristics of a good user interface	1	10/02/2026		TLM1,2	
34.	Basic concepts, Types of user interfaces	1	11/02/2026		TLM1,2	
35.	Fundamentals of component-based GUI development	1	13/02/2026		TLM1,2	
36.	user interface design methodology.	1	14/02/2026		TLM1,2	
37.	Tutorial	1	17/02/2026			
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Coding, Code review	1	18/02/2026		TLM1,2	
39.	Software documentation, Testing.	1	20/02/2026		TLM1,2	
40.	Black-box testing	1	21/02/2026		TLM1,2	
41.	White-Box testing	1	24/02/2026		TLM1,2	
42.	Debugging, Program analysis tools	1	25/02/2026		TLM1,2	
43.	Integration testing	1	27/02/2026		TLM1,2	
44.	Testing object-oriented programs	1	28/02/2026		TLM1,2	
45.	Smoke testing, and some general issues associated with testing.	1	3/03/2026		TLM1,2	
46.	Software Reliability and Quality Management: Software reliability	1	4/03/2026		TLM1,2	
47.	Software quality management system	1	6/03/2026		TLM1,2	
48.	ISO 9000.SEI Capability maturity model	1	7/03/2026		TLM1,2	
49.	Few other important quality standards, and Six Sigma.	1	10/03/2026		TLM1,2	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Introduction Computer-Aided Software Engineering (CASE), CASE and its scopes	1	11/03/2026		TLM1,2	
51.	CASE environment	1	13/03/2026		TLM1,2	
52.	CASE support in the software life cycle. CASE support in the software life cycle	1	14/03/2026		TLM1,2	
53.	CASE support in the software life cycle, other characteristics of CASE tools	1	17/03/2026		TLM1,2	
54.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	18/03/2026		TLM1,2	
55.	Architecture of a CASE Environment.	1	20/03/2026		TLM1,2	
56.	Software Maintenance: Characteristics of software maintenance	1	21/03/2026		TLM1,2	

57.	Software reverse engineering	1	24/03/2026		TLM1,2	
58.	Software maintenance process models	1	25/03/2026		TLM1,2	
59.	Estimation of maintenance cost.	1	27/03/2026		TLM1,2	
60.	Software Reuse: reuse-definition.	1	28/03/2026		TLM1,2	
61.	Introduction, Reason behind no reuse so far	1	31/03/2025		TLM3	
62.	Basic issues in any reuse program	1	1/04/2026			
63.	A reuse approach and Reuse at organization level.	1	3/04/2026			
64.	ASSIGNMENT-5		4/04/2026		TLM3	
No. of classes required to complete UNIT-V: 14				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	28/03/25		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.P.Veera Swamy**	**Dr. J. Nageswara Rao**	**Dr. Y. Vijaya Bhaskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., IV-Sem., CSE-B
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE : 2-0-0
COURSE CREDITS : 0
COURSE INSTRUCTOR : Dr. Shaheda Niloufer
COURSE COORDINATOR : Dr. Shaheda Niloufer
PRE-REQUISITES : Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	02-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	06-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	09-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	16-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	20-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	23-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	27-12-2025					
No. of classes required to complete UNIT-I		05			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	30-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	03-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids	1	06-01-2026		TLM1	CO2	T1,T2	
11.	Types of ecosystems	1	17-01-2026		TLM1	CO2	T1,T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	20-01-2026		TLM1	CO2	T1,T2	
13.	Values of Biodiversity, India as mega diversity nation	1	24-01-2026		TLM1	CO2	T1,T2	

14.	Threats to biodiversity and Conservation of biodiversity	1	24-01-2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Environmental pollution -Air pollution	1	03-02-2026		TLM1	CO3	T1,T2	
16.	Water pollution, Marine pollution, Thermal pollution	1	07-02-2026		TLM1	CO3	T1,T2	
17.	Soil pollution	1	10-02-2026		TLM1	CO3	T1,T2	
18.	Noise pollution & Nuclear Hazards	1	17-02-2026		TLM1	CO3	T1,T2	
19.	Solid waste management	1	21-02-2026		TLM1	CO3	T1,T2	
20.	Disaster management	1	24-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
21.	From Unsustainable to Sustainable development	1	28-02-2026		TLM1	CO4	T1,T2	
22.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	03-03-2026		TLM1	CO4	T1,T2	
23.	Environmental ethics, Climate change	1	07-03-2026		TLM1	CO4	T1,T2	
24.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	10-03-2026		TLM1	CO4	T1,T2	
25.	Environmental Acts	1	14-03-2026		TLM1	CO4	T1,T2	
26.	Environmental Acts	1	17-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	24-03-2026		TLM1	CO5	T1,T2	
28.	Environment and human health –Human Rights – Value Education	1	28-03-2026		TLM1	CO5	T1,T2	
29.	HIV/AIDS – Women and Child Welfare	1	31-03-2026		TLM1	CO5	T1,T2	
30.	Role of information Technology in Environment and human health	1	04-04-2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		04			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
31.	Case studies	2	27-01-2026 14-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. SunilKumar Ketineni
Course Name & Code : Operating Systems -23CS06
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/B-sec **A.Y.:** 2025-26

PREREQUISITE: Computer organization

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

• Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection

• Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.

• Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018

2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS:

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018

2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems & System Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	01-12-2025		TLM2	
2.	operating system functions, operating systems operations	1	04-12-2025		TLM2	
3.	Computing environments, Free and Open-Source Operating Systems.	2	05-12-2025 06-12-2025		TLM2	
4.	Operating System Services, User and Operating-System Interface, system calls,	2	08-12-2025 11-12-2025		TLM2	
5.	Tutorial on Types of System Calls, system programs,	2	12-12-2025 13-12-2025		TLM2	
6.	operating system Design and Implementation	1	15-12-2025		TLM2	
7.	operating system structure,	1	18-12-2025		TLM2	
8.	Tutorial on Building and Booting an Operating System	1	19-12-2025		TLM2	
9.	Operating system debugging.	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Process Concept, Process scheduling	1	22-12-2025		TLM2	
11.	Operations on processes, Inter-process communication	1	26-12-2025		TLM2	
12.	Multithreading models	1	27-12-2025		TLM2	
13.	Thread libraries, Threading issues	1	29-12-2025		TLM2	
14.	CPU Scheduling Basic concepts, Scheduling criteria,	2	01-01-2026 02-01-2026		TLM2	
15.	Scheduling criteria,	1	03-01-2026		TLM2	
16.	Tutorial on Scheduling algorithms,	1	05-01-2026		TLM2	
17.	FCFS,SJF	1	08-01-2026		TLM2	
18.	Priority,round robin	2	09-01-2026 10-01-2026		TLM2	
19.	Tutorial on Multiple processor scheduling.	2	19-01-2026 22-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Synchronization Tools &Deadlocks

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	The Critical Section Problem	1	23-01-2026		TLM1	
21.	Peterson's Solution, Mutex Locks,	1	24-01-2026		TLM1	
22.	Tutorial on Semaphores, Monitors,	1	02-02-2026		TLM1	
23.	Classic problems of Synchronization	1	05-02-2026		TLM1	
24.	system Model, Deadlock characterization,	1	06-02-2026		TLM1	
25.	Tutorial on Methods for handling Deadlocks,	1	07-02-2026		TLM1	
26.	Deadlock prevention	1	09-02-2026		TLM1	
27.	Deadlock avoidance	1	12-02-2026		TLM1	
28.	Tutorial on Deadlock detection,	1	13-02-2026		TLM1	
29.	Recovery from Deadlock.	1	14-02-2026		TLM1	
No. of classes required to complete UNIT-III: 10						

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction of Memory-Management Strategies	1	16-02-2026		TLM1	
31.	Contiguous memory allocation	1	20-02-2026		TLM1	
32.	Tutorial on Paging, Structure of the Page Table, Swapping.	1	21-02-2026		TLM1	
33.	Introduction of Virtual Memory Management	1	23-02-2026		TLM1	
34.	Demand paging, Copy-on-write	1	26-02-2026		TLM1	
35.	Page replacement	1	27-02-2026		TLM1	
36.	Tutorial on Allocation of frames, Thrashing	1	28-02-2026		TLM1	
37.	Introduction of Storage Management	1	02-03-2026		TLM1	
38.	Overview of Mass Storage Structure	1	05-03-2026		TLM1	
39.	HDD Scheduling	1	06-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Tutorial on File concept, Access methods, Directory Structure	1	07-03-2026		TLM2	
41.	File-system structure,	1	09-03-2026		TLM2	
42.	File-system Operations,	1	12-03-2026		TLM2	

43.	Directory implementation,	1	13-03-2026		TLM2	
44.	Allocation method, Free space management	1	14-03-2026		TLM2	
45.	File-System Mounting,	1	16-03-2026		TLM2	
46.	Partitions and Mounting	1	20-03-2026		TLM2	
47.	Tutorial on File Sharing.	2	21-03-2026 22-03-2026		TLM2	
48.	Goals of protection,	2	24-03-2026 27-03-2026		TLM2	
49.	Principles of protection	2	28-03-2026 29-03-2026		TLM2	
50.	Protection Rings,	2	31-03-2026 02-04-2026		TLM2	
51.	Domain of protection, Access matrix.	2	03-04-2026 04-04-2026		TLM2	
No. of classes required to complete UNIT-V: 17				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web application and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. SunilKumar Ketineni**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. N V NAIK
Course Name & Code : Database Management Systems Lab (23CS56)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-B A.Y: 2025-26

Pre-Requisites : Data Structures and Operating Systems

COURSE EDUCATIONAL OBJECTIVES (CEOs):: This Course will enable students to

1. Populate and query a database using SQL DDL/DML Commands

2. Declare and enforce integrity constraints on a database

3. Writing Queries using advanced concepts of SQL

4. Programming PL/SQL including procedures, functions, cursors and triggers

COURSE OUTCOMES (COs): At the end of the course, students can

CO 1	Implement SQL queries using DDL/DML commands.(Apply-L3)
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. (Apply-L3)
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. .(Apply-L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
C04	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using the SELECT command	3+3	03-12-2025 10-12-2025		TLM4	
2	Queries (along with sub-Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example: - Select the roll number and name of the student who secured fourth rank in the class	3	17-12-2025		TLM4	
3	Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views	3	24-12-2025		TLM4	
4	Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)	3	31-12-2025		TLM4	
5	Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks	3	07-01-2026		TLM4	

	can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)					
6	Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block	3	21-01-2026		TLM4	
7	Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions	3	04-02-2026		TLM4	
8	Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR	3	11-02-2026		TLM4	
9	Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES	3	18-02-2026		TLM4	
10	Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions	3	25-02-2026		TLM4	
11	Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.	3	11-03-2026		TLM4	
12	Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers	3	18-03-2026		TLM4	
13	Case studies	3	25-03-2026		TLM4	

13	Internal Exam	3	01-04-2026			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.N V NAIK**	**Dr. M.Srinivasa Rao**	**Dr. Y V Bhaskar Reddy**	**Dr. S.N Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. G.V.Rajya Lakshmi
Course Name & Code **:** Full Stack Development-I (23CSS2)
L-T-P Structure **:** 0-1-2 **Credits:** 2
Program/Sem/Sec : B.Tech. – CSE/IV/B **A.Y.:** 2025-26

PREREQUISITE: Basic Computer Fundamentals, Programming Knowledge

COURSE EDUCATIONAL OBJECTIVES (CEOs): Make use of HTML elements and their attributes for designing static web pages. Build a web page by applying appropriate CSS styles to HTML elements. Experiment with JavaScript to develop dynamic web pages and validate forms.

COURSE OUTCOMES (COs): At the end of the course, students will be able to

CO1	Design static web pages by using HTML elements. **(Apply-L3)**
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. **(Apply-L3)**
CO3	Develop dynamic web pages and validate forms using JavaScript. **(Apply-L3)**
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 - Low **2 –**Medium **3 -** High															

REFERENCE BOOKS:

R1	Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
R2	Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
R3	Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	FSD-I Introduction & COs discussion	3	01-12-2025		**DM5**	
2.	HTML basic tags, Lists, Links & Images	3	08-12-2025		**DM5**	
3.	HTML Tables, Forms	3	15-12-2025		**DM5**	
4.	HTML Frames	3	22-12-2025		**DM5**	
5.	HTML5, Introduction to CSS	3	29-12-2025		**DM5**	
6.	Types of CSS	3	05-01-2026		**DM5**	
7.	Selectors & its types	3	19-01-2026		**DM5**	
8.	CSS Color, Background, text & font Properties, Box Model	3	02-02-2026		**DM5**	
9.	JavaScript Introduction & syntax	3	09-02-2026		**DM5**	
10.	Internal & external JavaScript, I/O, type conversion	3	16-02-2026		**DM5**	
11.	JavaScript Conditional & looping statements	3	23-02-2026		**DM5**	
12.	Predefined & userdefined objects, DOM	3	02-03-2026		**DM5**	
13.	JavaScript functions & events Form Validations	6	16-03-2026		**DM5**	
14.	Introduction to Node.js	3	23-03-2026		**DM5**	
15.	Internal Exam	3	30-03-2026		**DM4**	

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 9	**Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mrs.G.V.Rajya Lakshmi	Dr. S. Nagarjuna Reddy	Dr. Y.V.B. Reddy	Dr. S. Nagarjuna Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **Dr.K DeviPriya**,
Regulation : R23
L-T-P Structure **:** 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – B Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:
1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. IdrisMootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:
1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:
• https://nptel.ac.in/courses/110/106/110106124/
• https://nptel.ac.in/courses/109/104/109104109/
• https://swayam.gov.in/nd1_noc19_mg60/preview
• https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Saturday (from 9.00 AM – 12.00 PM)

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–IIntroduction to Design Thinking,** Introduction to elements and principles of Design, basics of design-dot, line, shape, form asfundamental design components	3	05-12-2025		TLM2/ TLM4	
02	Principles of design	3	12-12-2025		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	19-12-2025		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	26-12-2025		TLM1	
05	Design thinking in social innovations. Tools of	3	2-01-2026		TLM2	

	design thinking - person, costumer					
06	journey map, brainstorming, product development (Activity)	3	19-01-2026		TLM4/ TLM6	
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	23-01-2026		TLM1/ TLM4/ TLM6	
I Mid Exams: 26-01-2026 to31-01-2026						
08	Creativity to Innovation. Teams for innovation, Measuring theimpact and value of creativity.	3	30-01-2026		TLM2/ TLM4/ TLM6	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	6-02-2026		TLM4/ TLM6	
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	13-02-2026		TLM1/ TLM4/ TLM6	
11	Product planning, product specifications. Innovation towards product design Case studies.	3	20-02-2026, 27-2-2026		TLM2/ TLM6	
12	**Activity:** Importance of modeling, how to set specifications,Explaining their own product design	3	6-03-2026		TLM4/ TLM6	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	13-03-2026		TLM1/ TLM4/ TLM6	
14	Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme	3	20-03-2026		TLM2/ TLM4/ TLM6	

	competition, Standardization					
15	Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.	3	27-03-2026		TLM1/ TLM4/ TLM6	
16	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	3-04-2026		TLM4/ TLM6	
II Mid Exams: 06-04-2026 to 11-04-2026						
No. of classes required to complete: 48				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-B

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Name of the Faculty	Dr.K DeviPriya	Dr.V.Rama Krishna	Dr.K DeviPriya	Dr.S.Nagarjuna Reddy
Designation	**Course Instructors**	**Course Coordinator**	**Module Coordinator**	**HoD**

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.U. RAMBABU
Course Name & Code : Managerial Economics and Financial Analysis & 23HS02
L-T-P Structure : 2-0-0 **Credits:** 2
Program/Sem/Sec : B.Tech/CSE/IV /C **A.Y.:** 2025-26

PREREQUISITE:
COURSE EDUCATIONAL OBJECTIVES(CEO):
To inculcate the basic knowledge of microeconomics and financial accounting
To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
To Know the Various types of market structure and pricing methods and strategy
To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
To provide fundamental skills in accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, students will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO↵	PO↳	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	–	–	–	–	2	–	1	–	–	–
CO2	3	2	2	1	1	–	–	–	–	2	–	1	–	–	–
CO3	3	2	1	1	1	1	1	–	2	3	–	1	–	–	–
CO4	3	2	2	1	1	–	–	–	1	2	2	1	–	–	–
CO5	3	2	2	1	2	–	–	–	1	3	2	1	–	–	–

1 - Low **2** –Medium **3** - High

Textbooks:
1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:
1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:
https://www.slideshare.net/123ps/managerial-economics-ppt https://www.slideshare.net/rossanz/production-and-cost-45827016 https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):SEC-C

UNIT-I: Introduction to Managerial Economics:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	01-12-2025		TLM2	
2.	Economics-Managerial Economics	1	03-12-2025		TLM2/TLM3	
3.	Nature and Scope.	1	04-12-2025		TLM2	
4.	Demand	1	08-12-2025		TLM2	
5.	Law of demand-	1	10-12-2025		TLM2	
6.	Elasticity of demand	1	11-12-2025		TLM2	
7.	Types of Elasticity of demand	2	15-12-2025 17-12-2025		TLM1/TLM3	
↵	Demand Forecasting -Methods.	2	18-12-2025 22-12-2025		TLM2	
↳	Unit-1 Revision	1	23-12-2025			
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Theory of Production and Cost analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Production Function	2	24-12-2025 29-12-2025		TLM2/TLM3	
11.	Isoquant and Isocost	2	31-12-2025 05-01-2026		TLM1/TLM2	
12.	Least Cost Combination of inputs	1	07-01-2026		TLM2/TLM3	
13.	Law of Returns	1	08-01-2026		TLM2	
14.	Internal and External Economies of Scale.	2	12-01-2026 14-01-2026		TLM2/TLM3	
15.	Cost Concepts	1	15-01-2026		TLM2	
16.	Break-even Analysis	2	19-01-2026 21-01-2026		TLM1/TLM3	
17.	Unit -2 Revision	1	22-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		
I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)						

UNIT-III: Markets & Pricing Policies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1↵	Market structures: Markets-Types of markets	1	02-02-2026		TLM2	
1↳	Features	2	04-02-2026		TLM2/TLM3	
20.	price out determinations under Perfect competition	1	05-02-2026		TLM2	

21.	Monopoly, Monopolistic Competition	2	09-02-2026 11-02-2026		TLM2/TLM3	
22.	Pricing –Pricing polices & its Objectives	1	12-02-2026		TLM2	
23.	Pricing Methods and its applications in business.	1	16-02-2026		TLM2	
24.	Unit 3 Revisioin	1	18-02-2026		TLM2/TLM3	
No. of classes required to complete UNIT-III: ↦				**No. of classes taken:**		

UNIT-IV: Unit -IV Capital and Capital Budgeting:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Nature and its significance,	1	19-02-2026		TLM1	
26.	Types of Capital	1	23-02-2026		TLM2	
27.	Sources of raising capital	1	25-02-2026		TLM2	
2↵	Capital budgeting-Significance & Process	1	26-02-2026		TLM2	
2↦	Techniques of Capital Budgeting (Non-Discounted)	2	02-03-2026 04-03-2026		TLM1/TLM3	
30.	Techniques of Capital Budgeting (Discounted)	2	05-03-2026 09-03-2026		TLM1	
31.	Unit-4 Revision	1	11-03-2026		TLM2/TLM3	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Financial Accounting and analysis:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Accounting –significance -	2	12-03-2026 16-03-2026		TLM2	
33.	Bookkeeping-Double entry system	1	18-03-2026		TLM2/TLM3	
34.	Journal	1	19-03-2026		TLM1	
35.	Ledger	1	23-03-2026		TLM1	
36.	Trial Balance	1	25-03-2026		TLM1/TLM3	
37.	Final Accounts with simple adjustments	1	26-03-2026		TLM1	
3↵	Financial Statement Analysis through ratios.	2	30-03-2026 01-04-2026		TLM1	
No. of classes required to complete UNIT-V: 9				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Stock Market Essentials: Knowledge for	1	02-04-2026		TLM2			

	Tomorrow's Leaders							
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III ,IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III ,IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and

	IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO ↵	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO ↳	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.U. RAMBABU**	**Dr. A. ADISESHA REDDY**	**Dr. A. ADISESHA REDDY**	**Dr.S.Nagarjuna Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE-C
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. T. Radha Rani
COURSE COORDINATOR : Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	01/12/2025		TLM1	CO1	T1, T2	
2.	Syllabus Co's, PO's	1	02/12/2025		TLM1	CO1	T1, T2	
3.	Unit-1, Introduction to data science	1	05/12/2025		TLM1	CO1	T1, T2	
4.	Statistics- Population and sample, Collection of data,	1	06/12/2025		TLM1	CO1	T1, T2	
5.	Types of variables	1	08/12/2025		TLM1	CO1	T1, T2	
6.	Data visualization	1	09/12/2025		TLM1	CO1	T1, T2	
7.	Measures of central tendency, A.M	1	12/12/2025		TLM1	CO1	T1, T2	
8.	Median, mode problems	1	15/12/2025		TLM1	CO1	T1, T2	
9.	Measures of variability Range, Mean deviation	1	16/12/2025		TLM1	CO1	T1, T2	
10.	S.D. & Q D	1	19/12/2025		TLM1	CO1	T1, T2	
11.	Skewness	1	20/12/2025		TLM1	CO1	T1, T2	
12.	Kurtosis	1	22/12/2025		TLM1	CO1	T1, T2	
13.	Tutorial	1	23/12/2025		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Correlation, types	1	26/12/2025		TLM1	CO2	T1, T2	
15.	Coefficient of correlation	1	27/12/2025		TLM1	CO2	T1, T2	
16.	Rnak correlation	1	29/12/2025		TLM1	CO2	T1, T2	
17.	Linear regression (lines)	1	30/12/2025		TLM1	CO2	T1, T2	
18.	Problems	1	02/01/2026		TLM1	CO2	T1, T2	
19.	Multiple regression	1	03/01/2026		TLM1	CO2	T1, T2	
20.	Regression coefficients	1	05/01/2026		TLM1	CO2	T1, T2	
21.	Properties, problems	1	06/01/2026		TLM1	CO2	T1, T2	
22.	Fitting of parabola	1	09/01/2026		TLM1	CO2	T1, T2	
23.	Exponential curve	1	17/01/2026		TLM1	CO2	T1, T2	
24.	Fitting of power curve	1	19/01/2026		TLM1	CO2	T1, T2	
25.	Tutorial II	1	20/01/2026		TLM3	CO2	T1, T2	
26.	Problems	1	23/01/2026		TLM1	CO2	T1, T2	
27.	Revision	1	24/01/2026		TLM1	CO2	T1, T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Probability, Introduction	1	02/02/2026		TLM1	CO3	T1, T2	
29.	Conditional probability	1	03/02/2026		TLM1	CO3	T1, T2	
30.	Bayes theorem	1	06/02/2026		TLM3	CO3	T1, T2	
31.	Problems	1	07/02/2026		TLM1	CO3	T1, T2	
32.	Random variables, Distribution function	1	09/02/2026		TLM1	CO3	T1, T2	
33.	Probability mass function	1	10/02/2026		TLM1	CO3	T1, T2	
34.	Probability density function	1	14/02/2026		TLM1	CO3	T1, T2	
35.	Mathematical expectation variance	1	16/02/2026		TLM3	CO3	T1, T2	
36.	Binomial distribution	1	17/02/2026		TLM1	CO3	T1, T2	
37.	Poisson distribution	1	20/02/2026		TLM1	CO3	T1, T2	
38.	Normal distribution	1	21/02/2026		TLM1	CO3	T1, T2	
39.	Uniform distribution	1	23/02/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction: population & sample Sampling distribution	1	24/02/2026		TLM1	CO4	T1, T2	
41.	Sampling distribution of means & variance	1	27/02/2026		TLM1	CO4	T1, T2	
42.	problems	1	28/02/2026		TLM1	CO4	T1, T2	
43.	Central limit theorem	1	02/03/2026		TLM3	CO4	T1, T2	
44.	Estimation- point & interval, maximum error	1	03/03/2026		TLM1	CO4	T1, T2	
45.	Estimation using t-distribution	1	06/03/2026		TLM1	CO4	T1, T2	
46.	problems	1	07/03/2026		TLM3	CO4	T1, T2	
47.	Estimation using F-distribution	1	09/03/2026		TLM1	CO4	T1, T2	
48.	Estimation using χ^2 −distribution	1	10/03/2026		TLM1	CO4	T1, T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Multiple Integrals (Multi variable Calculus)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Hypothesis: introduction, Definitions	1	13/03/2026		TLM1	CO5	T1, T2	
50.	Z-test for single mean	1	16/03/2026		TLM1	CO5	T1, T2	

51.	Z-test for diff. of mean	1	17/03/2026		TLM3	CO5	T1, T2	
52.	Z-test for single proportion	1	20/03/2026		TLM1	CO5	T1, T2	
53.	Z-test for difference of proportion	1	23/03/2026		TLM1	CO5	T1, T2	
54.	t-test for single mean	1	24/03/2026		TLM1	CO5	T1, T2	
55.	t-test for diff. means,	1	27/03/2026		TLM1	CO5	T1, T2	
56.	F-test for variances	1	28/03/2026		TLM1	CO5	T1, T2	
57.	χ^2 −test for goodness of fit	1	30/03/2026		TLM1	CO5	T1, T2	
58.	χ^2 −test for independence	1	04/04/2026		TLM1	CO5	T1, T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
59.	Paired t-test	1	27/03/2026		TLM1	CO5	T1, T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. T. Radha Rani	**Dr. D. Vijay Kumar**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	Head of the Department

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. M. Baby Anusha
Course Name & Code : OPERATING SYSTEMS Lab & 20CS55
L-T-P Structure : 0-0-3 **Credits:1.5**
Program/Sem/Sec : B.Tech. - CSE/IV/C **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation
- Implement Bankers Algorithms to Avoid the Dead Lock
- acquire the generic software development skill through various stages of software life cycle
- generate test cases for software testing

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the pthreads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 - Low						**2** –Medium						**3** - High			

REFERENCE BOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
3. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
4. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGrawHill, 2013

Online Learning Resources:
1. https://www.cse.iitb.ac.in/~mythili/os/
2. http://peterindia.net/OperatingSystems.html
3. www.cs.washington.edu/~tom/nachos

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	3	02/12/2025		**DM5**	
2.	Lab Cycle-1	3	09/12/2025		**DM5**	
3.	Lab Cycle -2	3	16/12/2025		**DM5**	
4.	Lab Cycle-3	6	23/12/2025, 30/12/2025		**DM5**	
5.	Lab Cycle-4	3	06/01/2026		**DM5**	
6.	Lab Cycle-5	3	20/01/2026		**DM5**	
7.	Lab Cycle-6	3	03/02/2026		**DM5**	
8.	Lab Cycle-7	3	10/02/2026		**DM5**	
9.	Lab Cycle-8	3	17/02/2026		**DM5**	
10.	Lab Cycle9	3	24/02/2026		**DM5**	
11.	Lab Cycle10	3	03/03/2026		**DM5**	
12.	Lab Cycle11	3	10/03/2026		**DM5**	
13.	Lab Cycle12	3	17/03/2026		**DM5**	
14.	Practice Lab		24/03/2026		**DM5**	
15.	Internal Lab Exam	3	31/03/2026			

Teaching Learning Methods			
DM1	Chalk and talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Day-to-day work	A1 = 05
Record	A2 = 05
Internal test	A3 = 05
CIE Total: (A1+A2+A3)	**M1 = 15**
Procedure/Algorithm	B1 = 5
Experimentation/Program execution	B2 = 10
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 5
Viva voce	B5 = 5
SEE Total: (B1+B2+B3+B4+B5)	**M2 = 35**
Total Marks = CIE + SEE = (M1+M2)	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mrs. M. Baby Anusha**	**Dr. Ch. Venkata Narayana**	**Dr. D. Venkata Subbaiah**	**Dr. S. Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. M. Baby Anusha
Course Name & Code : Operating Systems -23CS06
L-T-P Structure : **3-1-0** **Credits:** 3
Program/Sem/Sec : B.Tech. - CSE/IV/C Sec **A.Y.:** 2025-26

PREREQUISITE: Knowledge of Computer fundamentals & Data structures & algorithms

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of the course is to make student:

- Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection
- Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock-handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1												
CO2	1	2	2										1		
CO3	2	3	1	2								2	1		
CO4	2	2	1	1							1			1	
CO5	1	2	2									2			1
1 - Low				**2** –Medium									**3** - High		

TEXT BOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4 th Edition, Pearson , 2016

Reference Books:

1. Operating Systems -Internals and Design Principles, Stallings W, 9 th edition, Pearson, 2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGrawHill, 2013

Online Learning Resources:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	02/12/2025		TLM2	
2.	operating system functions, operating systems operations	1	03/12/2025		TLM2	
3.	Computing environments	1	05/12/2025		TLM2	
4.	Free and Open-Source Operating Systems	1	09/12/2025		TLM2	
5.	System Structures: Operating System Services	1	10/12/2025		TLM2	
6.	System programs, System calls	1	12/12/2025		TLM2	
7.	Types of System Calls, system programs	1	16/12/2025		TLM2	
8.	operating system Design and Implementation	1	17/12/2025			
9.	Building and Booting an Operating System	1	19/12/2025		TLM2	
10.	Operating system debugging	1	23/12/2025		TLM2	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Processes: Process Concept,	1	24/12/2025		TLM2	
12.	Process scheduling	2	26/12/2025 30/12/2025		TLM2	
13.	Operations on processes	1	31/12/2025		TLM2	

14.	Inter-process communication systems	1	02/01/2026		TLM2	
15.	Threads and Concurrency: Multithreading models	2	06/01/2026, 07/01/2026		TLM2	
16.	Thread libraries and Thread issues	1	09/01/2026		TLM2	
17.	CPU Scheduling: Basic concepts	1	20/01/2026		TLM2	
18.	Scheduling Criteria	1	21/01/2026		TLM2	
19.	Scheduling algorithms	1	23/01/2026		TLM2	
20.	Multiple processor scheduling	1	24/01/2026		TLM2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Synchronization Tools

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Synchronization Tools: The Critical section problem, Peterson's solutions	1	03/02/2026		TLM1	
22.	Mutex Locks	1	04/02/2026		TLM1	
23.	Semaphores	1	06/02/2026		TLM1	
24.	Monitors	1	10/02/2026		TLM1	
25.	Classic problems of Synchronization	1	11/02/2026		TLM1	
26.	Synchronization examples	1	13/02/2026		TLM1	
27.	Deadlocks: System model and deadlock characterization	1	17/02/2026		TLM1	
28.	Methods for Handling deadlocks and deadlock prevention	1	18/02/2026		TLM1	
29.	Deadlock Avoidance	1	20/02/2026		TLM1	
30.	Deadlock detection	1	24/02/2026		TLM1	
31.	Recovery from deadlock	1	25/02/2026		TLM1	
No. of classes required to complete UNIT-III: 11						

UNIT-IV: Memory management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Memory-Management Strategies: Introduction	1	27/02/2026		TLM1	

33.	Contiguous Memory Allocation	1	03/03/2026		TLM1	
34.	Paging and structure of a page table	1	06/03/2026		TLM1	
35.	Swapping	1	10/03/2026		TLM1	
36.	Virtual Memory Management: Introduction, Demand paging and Copy-on-write	1	11/03/2026		TLM1	
37.	Page replacement	1	13/03/2026		TLM1	
38.	Allocation of frames	1	17/03/2026		TLM1	
39.	Thrashing	1	18/03/2026		TLM1	
40.	Storage Management: Overview of Mass Storage Structure, HDD Scheduling	1	20/03/2026		TLM1	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
41.	File System: File System Interface: File concept, Access methods and Directory Structure	1	23/03/2026		TLM2	
42.	File system Implementation: File-system structure File-system Operations	1	25/03/2026		TLM2	
43.	Allocation method, Free space management	1	25/03/2026		TLM2	
44.	File-System Internals: File-System Mounting	1	27/03/2026		TLM2	
45.	Partitions and Mounting and File Sharing	1	27/03/2026		TLM2	
46.	Protection: Goals of protection, Principles of protection	1	31/03/2026		TLM2	
47.	Protection Rings, Domain of protection and Access matrix	1	01/04/2026		TLM2	
No. of classes required to complete UNIT-V: 7				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Units-III, IV & V)	A2=5
II- Descriptive Examination (UNITS-III, IV & V)	M2=15
II-Quiz Examination (UNITS-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
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PSO 3	To inculcate an ability to analyze, design and implement database applications.

PART-D

PROGRAMME OUTCOMES (POs):

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Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. M. Baby Anusha	Dr. Ch.Venkata Narayana	Dr. D. Venkata Subbaiah	Dr. S. Nagarjuna Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Sambi Reddy G

Course Name & Code : DATABASE MANAGEMENT SYSTEMS & 23CS03

L-T-P Structure : 3-0-0 **Credits:** 3

Program/Sem/Sec : B. Tech IV Sem CSE – C Section **A.Y.:** 2025-26

PREREQUISITE : Data Structures

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra. Introduce the concepts of basic SQL as a universal Database language and to demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization. Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the foundation of database management system and various data models. (Understand- L2)
CO2	Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand- L2)
CO3	Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply - L3)
CO4	Apply various normalization techniques for efficient data handling. (Apply-L3)
CO5	Understand Transaction management, recovery & indexing techniques. (Understand-L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
1 - Low				**2** –Medium								**3** – High			

TEXTBOOKS:

T1 Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)..

T2 Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DBMS Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, Introduction: An overview of Database Management System	1	01-12-25		1 & 2	
2.	Database System Vs File System, Database System Concepts	1	03-12-25		1 & 2	
3.	Database Users, Advantages of Database systems.	1	04-12-25		1 & 2	
4.	Database applications	1	06-12-25		1 & 2	
5.	Database Models	1	08-12-25		1 & 2	
6.	Database Schema and Instances, Data Independence	1	10-12-25		1 & 2	
7.	Three Tier Schema Architecture for data independence	1	11-12-25		1 & 2	
8.	Database System Structure	1	13-12-25		1 & 2	
9.	Database environment, components	1	15-12-25		1 & 2	
10.	Centralized and Client Server architecture for the database.	1	17-12-25		1 & 2	
11.	Examples on Real time databases	1	18-12-25		1 & 2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Entity – Relationship model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Introduction to ER-Model	1	20-12-25		1 & 2	
13.	Representation of entities, attributes	1	22-12-25		1 & 2	
14.	entity set, relationship, relationship set,	1	24-12-25		1 & 2	
15.	constraints, sub classes, super class, inheritance,	1	27-12-25		1 & 2	
16.	specialization, generalization using ER Diagrams.	1	29-12-25		1 & 2	
17.	Case scenarios on ER diagrams	1	31-12-25		1 & 2	
18.	Introduction to relational model, concepts of domain,	1	01-01-26		1 & 2	
19.	Attribute, tuple, relation, Examples	1	03-01-26		1 & 2	
20.	importance of null values, examples	1	05-01-26		1 & 2	
21.	constraints (Domain, Key constraints, integrity constraints) and their importance,	1	07-01-26		1 & 2	
22.	Relational Algebra	1	08-01-26		1 & 2	

23.	Relational Calculus	1	10-01-26		1 & 2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		
I MID EXAMINATIONS (26-01-2026 TO 31-02-2026)						

UNIT-III: Introduction to SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Basic SQL, Simple Database schema, data types	1	19-01-26		1 & 2	
25.	Table definitions- create, alter commands in SQL	1	21-01-26		1 & 2	
26.	Different DML operations (insert, delete, update).	1	22-01-26		1 & 2	
27.	SQL querying (select and project) using where clause, arithmetic & logical operations,	1	24-01-26		1 & 2	
28.	SQL functions (Date and Time, Numeric, String conversion).	1	19-01-26		1 & 2	
29.	Creating tables with relationship, implementation of key and integrity constraints,	1	02-02-26		1 & 2	
30.	nested queries, sub queries.	1	04-02-26		1 & 2	
31.	grouping, aggregation, ordering commands	1	05-02-26		1 & 2	
32.	implementation of different types of joins	1	07-02-26		1 & 2	
33.	view(updatable and non-updatable), relational set operations.	1	09-02-26			
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Purpose of Normalization or schema refinement	1	11-02-26		1 & 2	
35.	Concept of functional dependency	1	12-02-26		1 & 2	
36.	FD closure and Attribute closure	1	14-02-26		1 & 2	
37.	First Normal form, Second Normal Form	1	16-02-26		1 & 2	
38.	Third Normal Form – Transitive dependency	1	18-02-26		1 & 2	
39.	Boyce-Codd normal form (BCNF) – properties	1	19-02-26		1 & 2	
40.	Examples on 1NF,2NF,3NF & BCNF	1	21-02-26		1 & 2	
41.	Lossless join and dependency preserving decomposition,	1	23-02-26		1 & 2	
42.	MVD, Fourth normal form(4NF),	1	25-02-26		1 & 2	
43.	Fifth Normal Form (5NF).	1	26-02-26		1 & 2	

44.	Examples on finding normal forms on given tables.	1	28-02-26		1 & 2	
45.	Tutorial on all normal forms.	1	02-03-26			
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Transaction Processing, Concurrency Control & Introduction to Indexing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to Transaction, Transaction State diagram, ACID properties	1	04-03-26		1 & 2	
47.	Concurrent Executions, Serializability	1	05-03-26		1 & 2	
48.	Recoverability, Implementation of Isolation	1	07-03-26		1 & 2	
49.	Testing for Serializability – view & conflict serializability	1	09-03-26		1 & 2	
50.	Two-Phase Locking Techniques for concurrency control:	1	11-03-26		1 & 2	
51.	Types of Locks, Time stamp-based locking.	1	12-03-26		1 & 2	
52.	Introduction to Recovery Protocols, Recovery Concepts	1	14-03-26		1 & 2	
53.	No-UNDO/REDO Recovery Based on Deferred Update	1	16-03-26		1 & 2	
54.	Recovery Techniques Based on Immediate Update, Shadow Paging,	1	18-03-26		1 & 2	
55.	ARIES – algorithm	1	19-03-26		1 & 2	
56.	Hash based Indexing	1	21-03-26			
57.	Revision on all concepts	1	23-03-26			
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	NoSQL databases	1	25-03-26					
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS 06-04-2026 TO 11-04-2026)								

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. Sambi Reddy G**	**Dr. M. Srinivasa Rao**	**Dr. Y.V. Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Sambi Reddy G
Course Name & Code : Data Base Management Systems Lab (23CS56)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-C A.Y: 2025-26

PRE-REQUISITE: Programming language, Discrete Mathematical Structures and Data Structures.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This Course will enable students to populate and query a database using SQL DDL/DML Commands. Declare and enforce integrity constraints on a database and writing Queries using advanced concepts of SQL. To program PL/SQL including procedures, functions, cursors and triggers.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Implement SQL queries using DDL/DML commands**. (Apply-L3)**
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design**. (Apply-L3)**
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. **(Apply-L3)**
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	-	-	3
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Create, alter, insert rows and Dropping of table	3	12-12-25		TLM4	
2	Select queries with various constraints	3	19-12-25		TLM4	
3	sub queries with operations	3	26-12-25		TLM4	
4	Queries using Aggregate functions	3	02-01-26		TLM4	

5	Queries using Conversion functions - date-time	3	09-01-26		TLM4	
6	Queries using Conversion functions – strings	3	16-01-26		TLM4	
7	Simple PL/SQL program	3	23-01-26		TLM4	
8	Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.	3	06-02-26		TLM4	
9	Programs include NESTED IF, CASE	3	13-02-26		TLM4	
10	Programs using WHILE & FOR loops	3	20-02-26		TLM4	
11	creation of procedures – IN & OUT parameters	3	27-02-26		TLM4	
12	Stored functions in PL/SQL	3	06-03-26		TLM4	
13	Programs using CURSORS	3	13-03-26		TLM4	
14	Programs using TRIGGERS	3	20-03-26		TLM4	
15	Search operations using Index and Non-Index, Design database for Case study	3	27-03-26		TLM4	
16	Internal Exam	3	03-04-26			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering

	solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using opensource programming environment for the success of organization.
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Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. Sambi Reddy G**	**Dr. M. Srinivasa Rao**	**Dr. Y.V. Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms.M.Samyuktha
Course Name & Code : SOFTWARE ENGINEERING & 23IT02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM /C **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3	-	2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low			**2 –**Medium								**3 -** High				

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering	1	1/12/2025		TLM1, 2	
2.	Evolving role of Software	1	2/12/2025		TLM1, 2	
3.	Software Development projects	1	4/12/2025		TLM1, 2	
4.	Exploratory style of software developments .	1	6/12/2025		TLM1, 2	
5.	Emergence of software engineering	1	8/12/2025		TLM1, 2	
6.	Notable changes in software development practices,	1	9/12/2025		TLM1, 2	
7.	Computer system engineering. Software Life Cycle Models.	1	11/12/2025		TLM1, 2	
8.	Software Life Cycle Models. Basic concepts	1	13/12/2025		TLM1, 2	
9.	Waterfall model and its extensions.	1	15/12/2025		TLM1, 2	
10.	Rapid application development Agile development model.	1	16/12/2025		TLM1, 2	
11.	Agile development model	1	18/12/2025		TLM1, 2	
12.	Spiral Model.	1	20/12/2025		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

13.	Software project management complexities	1	22/12/2025		TLM1,2	
14.	Responsibilities of a software project manager	1	23/12/2025		TLM1,2	
15.	Metrics for project size estimation Project estimation techniques	2	27/12/2025 29/12/2025		TLM1,2	
16.	Empirical Estimation techniques, COCOMO	2	30/12/2025 3/01/2026		TLM1,2	
17.	Halstead's software science, risk management.	1	5/01/2026		TLM1,2	
18.	Requirements Analysis and Specification	2	6/01/2026 8/01/2026		TLM1,2	
19.	Software Requirements Specification (SRS)	2	10/01/2026 19/01/2026		TLM1,2	
20.	Axiomatic specification, Algebraic specification	1	20/01/2026		TLM1,2	
21.	Executable specification and 4GL.	1	22/01/2026		TLM1,2	
22.	Tutorial	1	24/01/2026		TLM1,2	
No. of classes required to complete UNIT-II: 14				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Software Design Overview of the design process	1	2/02/2026		TLM1,2	
24.	How to characterize a good software design?	1	3/02/2026		TLM1,2	
25.	Layered arrangement of modules, Cohesion and Coupling	1	5/02/2026		TLM1,2	
26.	Approaches to software design	1	7/02/2026		TLM1,2	
27.	Agility and the Cost of Change, Agile Process	1	9/02/2026		TLM1,2	
28.	Extreme Programming (XP), Other Agile Process Models	1	10/02/2026		TLM1,2	
29.	Tool Set for the Agile Process	1	12/02/2026		TLM1,2	
30.	Function-Oriented Software Design: Overview of SA/SD methodology	1	14/02/2026		TLM1,2	
31.	Structured analysis, Developing the DFD model of a system	1	16/02/2026		TLM1,2	
32.	Structured design, Detailed design, and Design Review	1	17/02/2026		TLM1,2	
33.	User Interface Design: Characteristics of a good user interface	1	19/02/2026		TLM1,2	
34.	Basic concepts, Types of user interfaces	1	21/02/2026		TLM1,2	
35.	Fundamentals of component-based GUI development	1	23/02/2026		TLM1,2	
36.	user interface design methodology.	1	24/02/2026		TLM1,2	
37.	Tutorial	1	26/02/2026		TLM1,2	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Coding, Code review	1	28/02/2026		TLM1,2	
39.	Software documentation, Testing,	1	2/03/2026		TLM1,2	
40.	Black-box testing	1	3/03/2026		TLM1,2	
41.	White-Box testing	1	5/03/2026		TLM1,2	
42.	Debugging, Program analysis tools, Integration testing	1	7/03/2026		TLM1,2	
43.	Testing object-oriented programs, Smoke testing, and some general issues associated with testing.	1	9/03/2026		TLM1,2	
44.	Software Reliability and Quality Management: Software reliability	1	10/03/2026		TLM1,2	
45.	Software quality management system, ISO 9000.SEI Capability maturity model	1	12/03/2026		TLM1,2	
46.	Few other important quality standards, and Six Sigma.	1	14/03/2026		TLM1,2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction Computer-Aided Software Engineering (CASE), CASE and its scopes	1	16/03/2026		TLM1,2	
48.	CASE environment	1	17/03/2026		TLM1,2	
49.	CASE support in the software life cycle. CASE support in the software life cycle	1	21/03/2026		TLM1,2	
50.	CASE support in the software life cycle, other characteristics of CASE tools	1	23/04/2026		TLM1,2	
51.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	24/03/2026		TLM1,2	
52.	Software Maintenance: Characteristics of software maintenance, . Software reverse engineering	1	28/03/2026		TLM1,2	
53.	. Software maintenance process models and	1	30/03/2026		TLM1,2	

	Estimation of maintenance cost					
54.	Software Reuse: reuse-definition, Introduction, Reason behind no reuse so far	1	31/03/2026		TLM1,2	
55.	Basic issues in any reuse program	1	2/04/2026		TLM1,2	
56.	A reuse approach and Reuse at organization level.	1	4/04/2026		TLM1,2	
57.	ASSIGNMENT-5	1	4/04/2026		TLM3	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	28/03/25		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**MS.M.Samyuktha**	**Dr. J. Nageswara Rao**	**Dr. Y. Vijaya Bhaskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** II B. Tech., IV-Sem., CSE-C
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**: Environmental Science**
L-T-P STRUCTURE	**:** 2-0-0
COURSE CREDITS	**:** 0
COURSE INSTRUCTOR	**:** Dr. Shaheda Niloufer
COURSE COORDINATOR	**:** Dr. Shaheda Niloufer
PRE-REQUISITES	**:** Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	01-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	06-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	08-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	15-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	20-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	22-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	27-12-2025					
No. of classes required to complete UNIT-I		05			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	29-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	03-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids	1	05-01-2026		TLM1	CO2	T1,T2	
11.	Types of ecosystems	1	12-01-2026		TLM1	CO2	T1,T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	17-01-2026		TLM1	CO2	T1,T2	
13.	Values of Biodiversity, India as mega diversity nation	1	19-01-2026		TLM1	CO2	T1,T2	
14.	Threats to biodiversity	1	24-01-2026		TLM1	CO2	T1,T2	

	and Conservation of biodiversity							
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Environmental pollution -Air pollution	1	02-02-2026		TLM1	CO3	T1,T2	
16.	Water pollution, Marine pollution, Thermal pollution	1	07-02-2026		TLM1	CO3	T1,T2	
17.	Soil pollution	1	09-02-2026		TLM1	CO3	T1,T2	
18.	Noise pollution & Nuclear Hazards	1	16-02-2026		TLM1	CO3	T1,T2	
19.	Solid waste management	1	21-02-2026		TLM1	CO3	T1,T2	
20.	Disaster management	1	23-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
21.	From Unsustainable to Sustainable development	1	28-02-2026		TLM1	CO4	T1,T2	
22.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	02-03-2026		TLM1	CO4	T1,T2	
23.	Environmental ethics, Climate change	1	07-03-2026		TLM1	CO4	T1,T2	
24.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	09-03-2026		TLM1	CO4	T1,T2	
25.	Environmental Acts	1	16-03-2026		TLM1	CO4	T1,T2	
26.	Environmental Acts	1	23-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	28-03-2026		TLM1	CO5	T1,T2	
28.	Environment and human health –Human Rights – Value Education	1	30-03-2026		TLM1	CO5	T1,T2	
29.	HIV/AIDS – Women and Child Welfare	1	30-03-2026		TLM1	CO5	T1,T2	
30.	Role of information Technology in Environment and human health	1	04-04-2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		03			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
31.	Case studies	2	17-01-2026 23-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
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PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SrinivasaRao
Course Name & Code **:** Full Stack Development-I (23CSS2)
L-T-P Structure **:** 0-1-2 **Credits:** 2
Program/Sem/Sec : B.Tech. – CSE/IV/C **A.Y.:** 2025-26

PREREQUISITE: Basic Computer Fundamentals, Programming Knowledge

COURSE EDUCATIONAL OBJECTIVES (CEOs): Make use of HTML elements and their attributes for designing static web pages. Build a web page by applying appropriate CSS styles to HTML elements. Experiment with JavaScript to develop dynamic web pages and validate forms.

COURSE OUTCOMES (COs): At the end of the course, students will be able to

CO1	Design static web pages by using HTML elements. **(Apply-L3)**
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. **(Apply-L3)**
CO3	Develop dynamic web pages and validate forms using JavaScript. **(Apply-L3)**
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	3	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 - Low					**2** –Medium							**3** - High			

REFERENCE BOOKS:

R1	Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
R2	Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
R3	Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	FSD-I Introduction & COs discussion	3	03/12/25		**DM5**	
2.	HTML basic tags, Lists, Links & Images	3	10/12/25		**DM5**	
3.	HTML Tables, Forms	3	17/12/25		**DM5**	
4.	HTML Frames	3	24/12/25		**DM5**	
5.	HTML5, Introduction to CSS	3	31/12/25		**DM5**	
6.	Types of CSS	3	07/01/26		**DM5**	
7.	Selectors & its types	3	21/01/26		**DM5**	
8.	CSS Color, Background, text & font Properties, Box Model	3	04/02/26		**DM5**	
9.	JavaScript Introduction & syntax	3	11/02/26		**DM5**	
10.	Internal & external JavaScript, I/O, type conversion	3	18/02/26		**DM5**	
11.	JavaScript Conditional & looping statements	3	25/02/26		**DM5**	
12.	Predefined & userdefined objects, DOM	3	04/03/26		**DM5**	
13.	JavaScript functions & events Form Validations	6	11/03/26 18/03/26		**DM5**	
14.	Introduction to Node.js	3	25/03/26		**DM5**	
15.	Internal Exam	3	01/04/26		**DM4**	

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mr. N. SrinivasaRao	Dr. S. Nagarjuna Reddy	Dr. Y.V.B. Reddy	Dr. S. Nagarjuna Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.D.K DeviPriya,
Regulation : R23
L-T-P Structure **:** 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – C Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:
1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. IdrisMootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:
1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:
• https://nptel.ac.in/courses/110/106/110106124/
• https://nptel.ac.in/courses/109/104/109104109/
• https://swayam.gov.in/nd1_noc19_mg60/preview
• https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Saturday (from 9.00 AM – 12.00 PM)

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–IIntroduction to Design Thinking,** Introduction to elements and principles of Design, basics of design-dot, line, shape, form asfundamental design components	3	04-12-2025		TLM2/ TLM4	
02	Principles of design	3	11-12-2025		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	18-12-2025		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	08-01-2026		TLM1	
05	Design thinking in social innovations. Tools of design thinking - person,	3	22-01-2026		TLM2	

	costumer					
06	journey map, brainstorming, product development (Activity)	3	29-01-2026		TLM4/ TLM6	
I Mid Exams: 26-01-2026 to31-01-2026						
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	05-02-2026		TLM1/ TLM4/ TLM6	
08	Creativity to Innovation. Teams for innovation, Measuring theimpact and value of creativity.	3	12-02-2026		TLM2/ TLM4/ TLM6	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	19-02-2026		TLM4/ TLM6	
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	27-02-2025		TLM1/ TLM4/ TLM6	
11	Product planning, product specifications. Innovation towards product design Case studies.	3	05-03-2026		TLM2/ TLM6	
12	**Activity:** Importance of modeling, how to set specifications,Explaining their own product design	3	12-03-2026		TLM4/ TLM6	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	19-03-2026		TLM1/ TLM4/ TLM6	
14	Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme	3	26-03-2026		TLM2/ TLM4/ TLM6	

	competition, Standardization					
15	Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.	3	02-04-2026		TLM1/ TLM4/ TLM6	
16	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	2-04-2026		TLM4/ TLM6	
II Mid Exams: 06-04-2026 to 11-04-2026						
No. of classes required to complete: 48				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-B

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Name of the Faculty	Dr.K DeviPriya	Dr.V.Rama Krishna	Dr.K DeviPriya	Dr.S.Nagarjuna Reddy
Designation	**Course Instructors**	**Course Coordinator**	**Module Coordinator**	**HoD**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(Autonomous)
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Accredited by NAAC with "A" Grade and NBA (CSE, IT, ECE, EEE & ME) under Tier - I
College Code: 76

MASTER OF BUSINESS ADMINISTRATION
COURSE HANDOUT

PART-A

NameofCourse Instructor :**M r s J . D I V Y A**
CourseName&Code :**MEFA-23HS02**
L-T-PStructure :2-0-0 Credits: 2
Program/Sem/Sec :CSEAIDS(D/Sec).,II-Sem. A. Y :2025-26

Prerequisite: BasicKnowledgeinbusinessactivities.

COURSE EDUCATIONAL OBJECTIVES(CEO):

- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate the capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3														
CO2	3	2													
CO3			2												
CO4				2		2									
CO5					2										
1 - Low				**2 –**Medium							**3 -** High				

Textbooks:

1. Varshney&Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607

https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Part-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:IntroductiontoBusinessEconomics

S.No.	Topicsto becovered	No.of ClassesRequired	Tentative Date of Completion	Actual Date of Completeon	TeachingLearn ing Methods	LearningOutcome COs	Text Book followed	HOD Sign Weekly
1.	Orientation	1	01/12/25		TLM1	CO1	T1,R2	
2.	Orientation	1	04/12/25		TLM1	CO1	T1,R2	
3.	IntroductiontoEconomics	1	06/12/25		TLM1	CO1	T1,R2	
4.	ExplainingaboutManagerial Economics	1	08/12/25		TLM1	CO1	T1,R2	
5.	DefinitionsofEconomics- NatureandScopeof Economics	1	11/12/25		TLM1	CO1	T1,R2	
6	Demand-Law of demand	1	13/12/25		TLM1	CO1	T1,R2	
7	Elasticity of demand	1	15/12/25		TLM1	CO1	T1,R2	
8	Types of Elasticity of demand	1	18/12/25		TLM1	CO1	T1,R2	
9	Demand Forecasting - Methods of demand forecasting	1	20/12/25		TLM3	CO1	T1,R2	
No.ofclassesrequiredtocomplete UNIT-I		09		No.ofclassestaken:				

UNIT-II:Theory of Production and Cost analysis

S.No.	Topicsto becovered	No.of ClassesRequired	Tentative Date of Completion	Actual Dateof Completion	TeachingLearningMethods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Production Function	1	22/12/2025		TLM1	CO2	T1,R2	
2.	Isoquant and Isocost	1	27/12/2025		TLM1	CO2	T1,R2	
3.	Least Cost Combinationof inputs	1	29/12/2025		TLM1	CO2	T1,R2	
4.	Law ofReturns	1	01/01/2026		TLM1	CO2	T1,R2	
5.	Internaland ExternalEconomies of Scale	1	03/01/2026		TLM1	CO2	T1,R2	
6.	Cost Concepts	1	05/01/2026		TLM1	CO2	T1,R2	
7.	Break-even Analysis	1	08/01/2026		TLM1	CO2	T1,R2	
No.ofclassesrequiredtocomplete UNIT-II		07		No.ofclassestaken:				

UNIT-III:Markets & Pricing Policies

S.No.	Topicsto becovered	No.of ClassesRequired	Tentative Date of Completion	Actual Date of Completion	TeachingLearningMethods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Market structures	1	10/01/2026		TLM1	CO3		
2.	Markets-Types of markets	1	12/01/2026		TLM1	CO3		
3.	Features and price out determinations under Perfect competition	1	15/01/2026		TLM1	CO3		
4.	Features and price out determinations under Monopoly	1	17/01/2026		TLM1	CO3		
5.	Features and price out determinations under Monopolistic competition	1	19/01/2026		TLM1	CO3	T2,R4	
6.	Pricing–Pricingpolices&itsObjectives	1	22/01/2026		TLM1	CO3		
7.	PricingMethodsand itsapplicationsin business.	1	24/01/2026		TLM2	CO3		
8.	I MID EXAMS	1	26/01/2026		TLM1	CO3		
9.	I MID EXAMS	1	27/01/2026		TLM1	CO3		
10.	I MID EXAMS	1	29/01/2026		TLM1	CO3	T2,R4	
11.	I MID EXAMS	1	30/12/2026		TLM2	CO3	T2,R4	
No.ofclassesrequiredtocomplete UNIT-III		11		No.ofclassestaken:				

UNIT-IV:Capital and Capital Budgeting

S. No.	Topicsto becovered	No.of ClassesRequired	Tentative Date of Completion	Actual Date of Completion	TeachingLearningMethods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Nature and its significance	1	02/02/2026		TLM2	CO4	T2,R4	
2.	Types of Capital	1	05/02/2026		TLM2	CO4	T2,R4	
3.	Sources of raising capital	1	07/02/2026		TLM1	CO4	T2,R4	
4.	Capital budgeting Significance	1	09/02/2026		TLM1	CO4	T2,R4	
5.	Capital budgeting Process	1	12/02/2026		TLM1	CO4	T2,R4	
6.	Techniques of Capital Budgeting	1	16/02/2025		TLM1	CO4	T2,R4	
7	(non-discounted cash flow techniques and discounted cash flow of techniques).	1	19/02/2025		TLM1	CO4	T2,R4	
No.ofclassesrequiredtocomplete UNIT-IV		07		No.ofclassestaken:				

UNIT-V:Financial Accounting and analysis

S. No.	Topicsto becovered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	TeachingLearn ing Methods	Learning Outcome COs	Text Book followed	HOD Sign Week ly
1.	Accounting significance	1	21/02/2026		TLM1	CO5	T2,R4	
2.	Book Keeping	2	23/02/2026 26/02/2026		TLM1	CO5	T2,R4	
3.	-Double entrysystem	2	28/02/2026 02/03/2026		TLM1	CO5	T2,R4	
5	Journal entries	2	02/03/2026 05/03/2026		TLM1	CO5	T2,R4	
6.	Journal entries	2	07/03/2026 09/03/2026		TLM1	CO5	T2,R4	
7	Journal	2	12/03/2026 14/03/2026		TLM1	CO5	T2,R4	
8	Ledger	2	16/03/2026 19/03/2026		TLM1	CO5	T2,R4	
9	TrialBalance	2	21/03/2026 23/03/2026		TLM1	CO5	T2,R4	
10	Final Accounts withsimple adjustments	2	26/03/2026 28/03/2026		TLM1	CO5	T2,R4	
11	Financial Statement Analysis through ratios	2	30/03/2026 02/04/2026		TLM1	CO5	T2,R4	
08.	IIMid exams		06/04/2026		TLM1	CO5	T2,R4	
09.	IIMid exams		-		TLM1	CO5	T2,R4	

10	IIMid exams		-		TLM1	CO5	T2,R4	
1.	IIMid exams		11/04/2025					
No.ofclassesrequiredtocomplete UNIT-V		11		No.ofclassestaken:				

Contentbeyond syllabus

S. No.	Topicsto becovered	No. of Classes Required	Tentative Date of Completeon	Actual Date of Completion	TeachingLearningMethods	LearningOutcome COs	Text Book followed	HOD Sign Week ly
1.	Financialaccounting	1	02/04/2026					
2.	Behavioraleconomics	1	04/04/2026					
		02						

TeachingLearningMethods			
TLM1	ChalkandTalk	**TLM4**	Demonstration(Lab/FieldVisit)
TLM2	PPT	**TLM5**	ICT(NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part–C- EVALUATIONPROCESS:

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	**A1=5**
I-Descriptive Examination (Units-I, II)	**M1=15**
I-Quiz Examination (Units-I, II)	**Q1=10**
Assignment-II (III,IV & V)	**A2=5**
II- Descriptive Examination (Unit-III,IV & V)	**M2=15**
II-Quiz Examination (Unit-III,IV & V)	**Q2=10**
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	**30**
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	**70**
Total Marks = CIE + SEE	**100**

PART-D: PROGRAMME OUTCOMES (POs) & PROGRAMME SPECIFIC OUTCOMES (PSOs):

Program Outcomes (POs):

PO 1:	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2:	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3:	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4:	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5:	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6:	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7:	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO 1:	**Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	**VLSI and Embedded Systems:** Design and Analyze Analog and Digital Electronic Circuits or systems and implement real time applications in the field of VLSI and Embedded Systems using

	relevant tools
PSO 3:	**Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Date:

Mrs. J DIVYA	DR.A .Adisesha Reddy	DR.A .Adisesha Reddy	
Course Instructor	**CourseCoordinator**	**Module Coordinator**	**HOD**

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE D
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. K. Jhansi Rani
COURSE COORDINATOR : Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	02/12/2025		TLM1	CO1	T1,T2	
2.	Syllabus Co's, PO's	1	03/12/2025		TLM1	CO1	T1,T2	
3.	Unit-1, Introduction to data science	1	04/12/2025		TLM1	CO1	T1,T2	
4.	Statistics- Population and sample, Collection of data,	1	05/12/2025		TLM1	CO1	T1,T2	
5.	Types of variables	1	09/12/2025		TLM1	CO1	T1,T2	
6.	Data visualization	1	10/12/2025		TLM1	CO1	T1,T2	
7.	Measures of central tendency, A.M	1	11/12/2025		TLM1	CO1	T1,T2	
8.	Median, mode problems	1	12/12/2025		TLM1	CO1	T1,T2	
9.	Measures of variability Range, Mean deviation	1	16/12/2025		TLM1	CO1	T1,T2	
10.	S.D. & Q D	1	17/12/2025		TLM1	CO1	T1,T2	
11.	Skewness	1	18/12/2025		TLM1	CO1	T1,T2	
12.	Kurtosis	1	23/12/2025		TLM1	CO1	T1,T2	
13.	TUTORIAL I	1	19/12/2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Types of Correlation	1	24/12/2025		TLM1	CO2	T1,T2	
15.	Coefficient of correlation	1	26/12/2025		TLM1	CO2	T1,T2	
16.	Rnak correlation	1	30/12/2025		TLM1	CO2	T1,T2	
17.	Linear regression (lines)	1	31/12/2025		TLM1	CO2	T1,T2	
18.	Problems	1	02/01/2026		TLM1	CO2	T1,T2	
19.	Multiple regression	1	06/01/2026		TLM1	CO2	T1,T2	
20.	Regression coefficients	1	07/01/2026		TLM1	CO2	T1,T2	
21.	Properties, problems	1	08/01/2026		TLM1	CO2	T1,T2	
22.	Fitting of parabola	1	09/01/2026		TLM1	CO2	T1,T2	
23.	Exponential curve	1	20/01/2026		TLM1	CO2	T1,T2	
24.	Fitting of power curve	1	21/01/2026		TLM1	CO2	T1,T2	
25.	TUTORIAL II	1	22/01/2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign

		Required	Completion	Completion	Methods	COs	followed	Weekly
26.	Probability, Introduction	1	23/01/2026		TLM1	CO3	T1,T2	
27.	Conditional probability	1	03/02/2026		TLM1	CO3	T1,T2	
28.	Bayes theorem	1	04/02/2026		TLM1	CO3	T1,T2	
29.	Problems	1	05/02/2026		TLM1	CO3	T1,T2	
30.	Random variables, Distribution function	1	06/02/2026		TLM1	CO3	T1,T2	
31.	Probability mass function	1	10/02/2026		TLM1	CO3	T1,T2	
32.	Probability density function	1	11/02/2026		TLM1	CO3	T1,T2	
33.	Mathematical expectation, variance	1	12/02/2026		TLM1	CO3	T1,T2	
34.	Binomial distribution	1	13/02/2026		TLM1	CO3	T1,T2	
35.	Poisson distribution	1	17/02/2026		TLM1	CO3	T1,T2	
36.	problems	1	18/02/2026		TLM1	CO3	T1,T2	
37.	Normal distribution	1	19/02/2026		TLM1	CO3	T1,T2	
38.	TUTORIAL III	1	20/02/2026		TLM3	CO3	T1,T2	
39.	Uniform distribution	1	24/02/2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		14			No. of classes taken:			

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
38.	Introduction: population & sample Sampling distribution	1	25/02/2026		TLM1	CO4	T1,T2	
39.	Sampling distribution of means & variance	1	26/02/2026		TLM1	CO4	T1,T2	
40.	problems	1	27/02/2026		TLM1	CO4	T1,T2	
41.	Central limit theorem	1	03/03/2026		TLM1	CO4	T1,T2	
42.	Estimation- point & interval, maximum error	1	05/03/2026		TLM1	CO4	T1,T2	
43.	Estimation using t-distribution	1	06/03/2026		TLM1	CO4	T1,T2	
44.	Estimation using F-distribution	1	10/03/2026		TLM1	CO4	T1,T2	
45.	Estimation using χ^2 −distribution	1	11/03/2026		TLM1	CO4	T1,T2	
46.	TUTORIAL IV	1	12/03/2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Multiple Integrals (Multi variable Calculus)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
47.	Hypothesis: introduction, Definitions	1	13/03/2026		TLM1	CO5	T1,T2	
48.	Z-test for single mean	1	17/03/2026		TLM1	CO5	T1,T2	

49.	Z-test for diff. of mean	1	18/03/2026		TLM1	CO5	T1,T2	
50.	Z-test for single proportion	1	20/03/2026		TLM1	CO5	T1,T2	
51.	Z-test for difference of proportion	1	24/03/2026		TLM1	CO5	T1,T2	
52.	t-test for single mean	1	25/03/2026		TLM1	CO5	T1,T2	
53.	t-test for diff. means,	1	27/03/2026		TLM1	CO5	T1,T2	
54.	F-test for variances	1	31/03/2026		TLM1	CO5	T1,T2	
55.	χ^2 −test for goodness of fit	1	01/04/2026		TLM1	CO5	T1,T2	
56.	χ^2 −test for independence	1	02/04/2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Paired t-test	1	02/04/2026		TLM1	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (16-12-2024 TO 21-12-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. K. Jhansi Rani	**Dr. D. Vijay Kumar**	**Dr. A. RAMI REDDY**	**Dr. T. SATYANARAYANA**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: P.Mary Kamala Kumari

Course Name & Code : 23CS06-OPERATING SYSTEMS

L-T-P Structure : **3-0-0** **Credits:** 3

Program/Sem/Sec : B.Tech/III/D **A.Y.:** 2025-26

Regulations : R23

PREREQUISITE: Computer Organization

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

- Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection.
- Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services**. (Understand-L2).**
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. **(Understand-L2).**
CO3	Analyze synchronization tools, deadlock handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. **(Apply-L3)**
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. **(Apply-L3)**
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. **(Apply-L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1										2	2	
CO5	2	2	2	3										3	3
1 - Low **2 –**Medium **3 -** High															

REFERENCE BOOKS:

T1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
T2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016.
R1	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R2	Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw Hill, 2013

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	1-12-25		TLM2	
2.	Introduction to Operating systems	1	2-12-25		TLM2	
3.	Introduction to Operating systems	1	5-12-25		TLM2	
4.	Introduction to Operating systems	1	6-12-25		TLM2	
5.	Operating System Functions	1	8-12-25		TLM2	
6.	Operating Systems Operations	1	9-12-25		TLM2	
7.	Computing Environments	1	12-12-25		TLM2	
8.	Free and Open-Source Operating Systems.	1	2-12-25		TLM2	
9.	Operating System Services	1	13-12-25		TLM2	
10.	User and Operating-System Interface	1	15-12-25		TLM2	
11.	System Calls, Types of System Calls	1	16-12-25		TLM2	
12.	System Programs	1	19-12-25		TLM2	
13.	Operating System Design and Implementation	1	20-12-25		TLM2	
14.	Operating System Structure	1	22-12-25		TLM2	
15.	Operating System Debugging	1	23-12-25		TLM2	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	Process Concept	1	26-12-25		TLM2	
17.	Process Scheduling	1	27-12-25		TLM2	
18.	Operations on Processes	1	29-12-25		TLM2	

19.	Inter-process Communication	1	30-12-25		TLM2	
20.	Multithreading Models	1	02-01-26		TLM2	
21.	Thread Libraries	1	03-01-26		TLM2	
22.	Threading Issues	1	05-01-26		TLM2	
23.	CPU Scheduling: Basic concepts	1	06-01-26		TLM2	
24.	CPU Scheduling: Basic concepts	1	09-01-26		TLM2	
25.	Scheduling Criteria	1	10-01-26		TLM2	
26.	Scheduling Algorithms	1	19-01-26		TLM2	
27.	Scheduling Algorithms	1	20-01-26		TLM2	
28.	Multiple Processor Scheduling	1	23-01-26		TLM2	
29.	Revision	1	24-01-26		TLM2	
No. of classes required to complete UNIT-II: 14				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	The Critical section problem, Peterson's solutions	1	02-02-26		TLM1	
31.	Synchronization hardware	1	03-02-26		TLM1	
32.	Semaphores	1	06-02-26		TLM1	
33. 34.	Classic problems of Synchronization	1	07-02-26		TLM1	
35.	Monitors	1	02-02-26		TLM1	
36.	Synchronization examples	1	09-02-26		TLM1	
37.	Atomic transactions	1	10-02-26		TLM1	
38.	System model and deadlock characterization	1	13-02-26		TLM1	
39.	Methods for Handling deadlocks and deadlock prevention	1	14-02-26		TLM1	
40.	Deadlock Avoidance	1	16-02-26		TLM1	
41.	Deadlock detection	1	17-02-26		TLM1	
42.	Recovery from deadlock	1	20-02-26		TLM1	
No. of classes required to complete UNIT-III: 12						

UNIT-IV: Memory Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Memory-Management Strategies: Introduction	1	21-02-26		TLM1	
44.	Contiguous Memory Allocation	1	23-02-26		TLM1	
45.	Paging, Structure of the Page Table, Swapping.	1	24-02-26 27-02-26		TLM1	
46.	Virtual Memory Management: Introduction	1	28-02-26 02-03-26		TLM1	
47.	Demand Paging	1	03-03-26		TLM1	
48.	Copy-on-Write	1	06-03-26		TLM1	
49.	Page replacement Algorithms	1	07-03-26		TLM1	
50.	Allocation of frames, Thrashing	1	09-03-26		TLM1	
51.	Storage Management: Overview	1	10-03-26		TLM1	

	of Mass Storage Structure					
52.	HDD Scheduling	1	13-03-26		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	File System: File System Interface:	1	16-03-26		TLM2	
53.	Access methods	1	17-03-26		TLM2	
54.	Directory Structure	1	20-03-26		TLM2	
55.	File System Implementation: File-System Structure	1	21-03-26		TLM2	
56.	File-system Operations	1	23-03-26		TLM2	
57.	Directory implementation	1	24-03-26		TLM2	
58.	Allocation Method	1	27-03-26		TLM2	
59.	Free Space Management	1	28-03-26		TLM2	
60.	File-System Mounting, Partitions and Mounting, File Sharing	1	30-03-26		TLM2	
61.	Protection: Goals of protection	1	31-03-26		TLM2	
62.	Principles of Protection	1	03-04-26		TLM2	
63.	Protection Rings	1	03-04-26		TLM2	
64.	Domain of Protection, Access Matrix	1	04-04-26		TLM2	
No. of classes required to complete UNIT-V: 13				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I,II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10

Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	P.M. Kamala Kumari	Dr. Ch. Venkata Narayana	Dr. D. Venkata Subbaiah	Dr. S. Nagarjuna Reddy
Signature				

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. P Rajasekhar
Course Name & Code : Database Management Systems & 23CS03
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B. Tech/IV/D **A.Y.:** 2025-26
PREREQUISITES : **Data Structures**

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): After successful completion of the course the students are able to

CO1	**Understand the foundation of database management system and various data models. (Understand- L2)**
CO2	**Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand-L2)**
CO3	**Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply-L3)**
CO4	**Apply various normalization techniques for efficient data handling. (Apply-L3)**
CO5	**Understand Transaction management, recovery & indexing techniques. (Understand-L2)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low						**2 –**Medium						**3 -** High			

TEXTBOOKS:

T1	Database Management Systems, 3rd edition, Raghu Rama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan, TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, Ramez Elmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Database System characteristics	1	01-12-2025		TLM1,2	
2.	Tutorial	1	04-12-25		TLM3	
3.	Database users	1	05-12-2025		TLM1,2	
4.	Advantages of database systems	1	06-12-2025		TLM1,2	
5.	Database applications	1	08-12-2025		TLM1,2	
6.	Tutorial	1	11-12-2025		TLM3	
7.	Data Models	1	12-12-2025		TLM1,2	
8.	Schema	1	13-12-2025		TLM1,2	
9.	Three tier schema architecture	2	15-12-2025 19-12-2025		TLM1,2	
10.	Tutorial	1	18-12-2025		TLM3	
11.	Database structure	1	20-12-2025		TLM1,2	
12.	Centralized and Client server architecture for the database	2	22-12-2025 26-12-2025		TLM1,2	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II: Entity Relationship Model and Relational Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	1	27-12-2025		TLM1,2	
2.	Representation of entities	1	29-12-2025		TLM1,2	
3.	Attributes, Entity set, Relationship, Relationship set	2	02-01-2026 03-01-2026		TLM1,2	
4.	Constraints, Sub classes, Super class, Inheritance, Specialization	1	05-01-2026		TLM1,2	
5.	Tutorial	1	08-01-2026		TLM3	
6.	Generalization using ER Diagrams	1	09-01-2026		TLM1,2	
7.	Introduction to relational model	2	10-01-2026 12-01-2026		TLM1,2	
8.	Tutorial	1	15-12-2026		TLM3	
9.	Concepts of domain, attribute, tuple, relation, importance of null values	1	16-01-2026		TLM1,2	
10.	Constraints (Domain, Key constraints, integrity constraints) and their importance	2	17-01-2026 19-01-2026		TLM1,2	
11.	Tutorial	1	22-01-2026		TLM3	
12.	Relational Algebra Relational Calculus	2	23-01-2026 24-01-2026		TLM1,2	
No. of classes required to complete UNIT-II: 16				**No. of classes taken:**		

UNIT-III: SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update)	1	02-02-2026		TLM1,2	
2.	Tutorial	1	05-02-2026		TLM3	
3.	SQL querying (select and project) using where clause, arithmetic & logical operations	2	06-02-2026 07-02-2026		TLM1,2	
4.	Tutorial	1	07-02-2026		TLM3	
5.	SQL functions (Date and Time, Numeric, String conversion)	1	09-02-2026		TLM1,2	
6.	Tutorial	1	12-02-2026			
7.	Creating tables with relationship, implementation of key and integrity constraints	2	13-02-2026 14-02-2026		TLM1,2	
8.	Nested queries, sub queries, grouping, aggregation, ordering,	1	16-02-2026		TLM1,2	
9.	Tutorial	1	19-02-2026		TLM3	
10.	implementation of different types of joins, view (updatable and non-updatable), relational set operations.	2	20-02-2026 21-02-2026		TLM1,2	
No. of classes required to complete UNIT-III: 13				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Purpose of Normalization or schema refinement	1	23-02-2026		TLM1,2	
2.	Tutorial	1	26-02-2026		TLM3	
3.	Concept of functional dependency	1	27-02-2026		TLM1,2	
4.	Normal forms based on functional dependency Lossless join and dependency preserving decomposition	2	28-02-2026 02-03-2026		TLM1,2	
5.	Tutorial	1	05-03-2026		TLM3	
6.	1NF, 2NF and 3 NF, concept of surrogate key, Boyce- Codd normal form (BCNF)	2	06-03-2026 07-03-2025		TLM1,2	
7.	MVD, Fourth normal form(4NF)	1	09-03-2026		TLM1,2	
8.	Tutorial	1	12-03-2026		TLM3	
9.	Fifth Normal Form (5NF)	1	13-03-2026		TLM1,2	
10.	Tutorial	1	14-03-2026		TLM3	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Transaction Processing and Concurrency Control

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Transaction State, ACID properties	1	16-03-2026		TLM1,2	
2.	Tutorial	1	19-03-2026		TLM3	
3.	Concurrent Executions, Serializability, Recoverability	2	20-03-2026 21-03-2026		TLM1,2	
4.	Implementation of Isolation, Testing for Serializability	1	23-03-2026		TLM1,2	
5.	Tutorial	1	26-03-2026		TLM3	
6.	Two-Phase Locking Techniques for concurrency control: Types of Locks, Time	1	27-03-2026		TLM1,2	

	stamp-based locking					
7.	Recovery Concepts	1	28-03-2026		TLM1,2	
8.	No-UNDO/REDO Recovery Based on Deferred Update	1	30-03-2026		TLM1,2	
9.	Tutorial	1	02-04-2026		TLM3	
10.	Recovery Techniques Based on Immediate Update	1	03-04-2026		TLM1,2	
11.	Shadow Paging, ARIES, Hash based Indexing	1	04-04-2026		TLM1,2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of Organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr. P Rajasekhar**	**Dr. M. Srinivasa Rao**	**Dr. Y V Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms.M.Samyuktha
Course Name & Code : SOFTWARE ENGINEERING & 23IT02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM /D **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3	-	2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low			**2 –**Medium								**3 -** High				

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering	1	2/12/2025		TLM1, 2	
2.	Evolving role of Software	1	3/12/2025		TLM1, 2	
3.	Software Development projects	1	4/12/2025		TLM1, 2	
4.	Exploratory style of software developments .	1	6/12/2025		TLM1, 2	
5.	Emergence of software engineering	1	9/12/2025		TLM1, 2	
6.	Notable changes in software development practices,	1	10/12/2025		TLM1, 2	
7.	Computer system engineering. Software Life Cycle Models.	1	11/12/2025		TLM1, 2	
8.	Software Life Cycle Models. Basic concepts	1	13/12/2025		TLM1, 2	
9.	Waterfall model and its extensions.	1	16/12/2025		TLM1, 2	
10.	Rapid application development Agile development model.	1	17/12/2025		TLM1, 2	
11.	Agile development model	1	18/12/2025		TLM1, 2	
12.	Spiral Model.	1	20/12/2025		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

13.	Software project management complexities	1	23/12/2025		TLM1,2	
14.	Responsibilities of a software project manager	1	24/12/2025		TLM1,2	
15.	Metrics for project size estimation Project estimation techniques	2	25/12/2025 27/12/2025		TLM1,2	
16.	Empirical Estimation techniques, COCOMO	2	30/12/2025 31/01/2026		TLM1,2	
17.	Halstead's software science, risk management.	1	3/01/2026		TLM1,2	
18.	Requirements Analysis and Specification	2	6/01/2026 7/01/2026		TLM1,2	
19.	Software Requirements Specification (SRS)	2	8/01/2026 10/01/2026		TLM1,2	
20.	Axiomatic specification, Algebraic specification	2	20/01/2026 21/01/2026		TLM1,2	
21.	Executable specification and 4GL.	1	22/01/2026		TLM1,2	
22.	Tutorial	1	24/01/2026		TLM1,2	
No. of classes required to complete UNIT-II: 15				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Software Design Overview of the design process	1	3/02/2026		TLM1,2	
24.	How to characterize a good software design?	1	4/02/2026		TLM1,2	
25.	Layered arrangement of modules, Cohesion and Coupling	1	5/02/2026		TLM1,2	
26.	Approaches to software design	1	7/02/2026		TLM1,2	
27.	Agility and the Cost of Change, Agile Process	1	10/02/2026		TLM1,2	
28.	Extreme Programming (XP), Other Agile Process Models	1	11/02/2026		TLM1,2	
29.	Tool Set for the Agile Process	1	12/02/2026		TLM1,2	
30.	Function-Oriented Software Design: Overview of SA/SD methodology	1	14/02/2026		TLM1,2	
31.	Structured analysis, Developing the DFD model of a system	1	17/02/2026		TLM1,2	
32.	Structured design, Detailed design, and Design Review	1	18/02/2026		TLM1,2	
33.	User Interface Design: Characteristics of a good user interface	1	19/02/2026		TLM1,2	
34.	Basic concepts, Types of user interfaces	1	21/02/2026		TLM1,2	
35.	Fundamentals of component-based GUI development	1	24/02/2026		TLM1,2	
36.	user interface design methodology.	1	25/02/2026		TLM1,2	
37.	Tutorial	1	26/02/2026		TLM1,2	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Coding, Code review	1	28/02/2026		TLM1,2	
39.	Software documentation, Testing,	1	3/03/2026		TLM1,2	
40.	Black-box testing	1	4/03/2026		TLM1,2	
41.	White-Box testing	1	5/03/2026		TLM1,2	
42.	Debugging, Program analysis tools, Integration testing	1	7/03/2026		TLM1,2	
43.	Testing object-oriented programs, Smoke testing, and some general issues associated with testing.	1	10/03/2026		TLM1,2	
44.	Software Reliability and Quality Management: Software reliability	1	11/03/2026		TLM1,2	
45.	Software quality management system, ISO 9000.SEI Capability maturity model	1	12/03/2026		TLM1,2	
46.	Few other important quality standards, and Six Sigma.	1	14/03/2026		TLM1,2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction Computer-Aided Software Engineering (CASE), CASE and its scopes	1	17/03/2026		TLM1,2	
48.	CASE environment	1	18/03/2026		TLM1,2	
49.	CASE support in the software life cycle. CASE support in the software life cycle	1	19/03/2026		TLM1,2	
50.	CASE support in the software life cycle, other characteristics of CASE tools	1	21/04/2026		TLM1,2	
51.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	24/03/2026		TLM1,2	
52.	Software Maintenance: Characteristics of software maintenance, . Software reverse engineering	1	25/03/2026		TLM1,2	
53.	. Software maintenance process models and	1	26/03/2026		TLM1,2	

	Estimation of maintenance cost					
54.	Software Reuse: reuse-definition, Introduction, Reason behind no reuse so far	2	28/03/2026 31/03/2026		TLM1,2	
55.	Basic issues in any reuse program	1	1/04/2026		TLM1,2	
56.	A reuse approach and Reuse at organization level.	1	2/04/2026		TLM1,2	
57.	ASSIGNMENT-5	1	4/04/2026		TLM3	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	26/03/25		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**MS.M.Samyuktha**	**Dr. J. Nageswara Rao**	**Dr. Y. Vijaya Bhaskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., IV-Sem., CSE-D
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE : 2-0-0
COURSE CREDITS : 0
COURSE INSTRUCTOR : Dr. Shaheda Niloufer
COURSE COORDINATOR : Dr. Shaheda Niloufer
PRE-REQUISITES : Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa, Environmental Studies, Academic Publishing Company,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,AText Book of Environmental Studies, Himalaya Publishing House, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	03-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	04-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	10-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	11-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	17-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	18-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	24-12-2025					
No. of classes required to complete UNIT-I		05			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	31-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	07-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids Types of ecosystems	1	08-01-2026		TLM1	CO2	T1,T2	
11.	Biodiversity – introduction, levels, bio geographic classification	1	21-01-2026		TLM1	CO2	T1,T2	

12.	Values of Biodiversity, India as mega diversity nation. Threats to biodiversity and Conservation of biodiversity	1	22-01-2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		05			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Environmental pollution -Air pollution	1	04-02-2026		TLM1	CO3	T1,T2	
14.	Water pollution, Marine pollution, Thermal pollution	1	05-02-2026		TLM1	CO3	T1,T2	
15.	Soil pollution	1	11-02-2026		TLM1	CO3	T1,T2	
16.	Noise pollution & Nuclear Hazards	1	12-02-2026		TLM1	CO3	T1,T2	
17.	Solid waste management	1	18-02-2026		TLM1	CO3	T1,T2	
18.	Disaster management	1	19-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	From Unsustainable to Sustainable development	1	25-02-2026		TLM1	CO4	T1,T2	
20.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	26-02-2026		TLM1	CO4	T1,T2	
21.	Environmental ethics, Climate change	1	04-03-2026		TLM1	CO4	T1,T2	
22.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	05-03-2026		TLM1	CO4	T1,T2	
23.	Environmental Acts	1	10-03-2026		TLM1	CO4	T1,T2	
24.	Environmental Acts	1	12-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	18-03-2026		TLM1	CO5	T1,T2	
26.	Environment and human health –Human Rights – Value Education	1	25-03-2026		TLM1	CO5	T1,T2	
27.	HIV/AIDS – Women and Child Welfare	1	01-03-2026		TLM1	CO5	T1,T2	
28.	Role of information Technology in Environment and human health	1	02-04-2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		04			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Case studies	2	08-01-2026 10-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: P. Mary Kamala Kumari
Course Name & Code : 23CS55-OPERATING SYSTEMS LAB
L-T-P Structure : 0-0-3 **Credits:1.5**
Program/Sem/Sec : B.Tech. - CSE/III/D **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer Hardware & Software.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores.
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation.
- Implement Bankers Algorithms to Avoid the Dead Lock.
- Acquire the generic software development skill through various stages of software life cycle
- Generate test cases for software testing.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. **(L3)**
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the pthreads library. **(L4)**
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system. **(L3)**
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	3	-	-	-	-	-	-	-	3	3	-
CO2	1	1	1	2	2	-	-	-	-	-	-	-	3	3	2
CO3	2	1	1	2	1	-	-	-	-	-	-	-	3	3	3
CO4	-	-	-	-	-	-	-	2	2	3	-	-	-	-	-
1 - Low						**2 –**Medium						**3 -** High			

REFERENCE BOOKS:

R1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley,2018.
R2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016.
R3	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018.
R4	Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw Hill, 2013.

Online Learning Resources:

1. https://www.cse.iitb.ac.in/~mythili/os/
2. http://peterindia.net/OperatingSystems.html
3. www.cs.washington.edu/~tom/nachos

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**Task-1:** Practicing of Basic UNIX Commands	3	05-12-2025		DM5	
2.	Lab Cycle-2	3	12-12-2025		DM5	
3.	Lab Cycle-3	3	19-12-2025		DM5	
4.	Lab Cycle-4	3	26-12-2025		DM5	
5.	Lab Cycle-5	3	02-01-26		DM5	
6.	Lab Cycle-6	3	09-01-26		DM5	
7.	Lab Cycle-7	3	23-01-26		DM5	
8.	Lab Cycle-8	3	06-02-26		DM5	
9.	Lab Cycle-9	3	13-02-26		DM5	
10.	Lab Cycle-10	3	20-02-26		DM5	
11.	Lab Cycle-11	3	27-02-26		DM5	
12.	Lab Cycle-12	3	06-03-26		DM5	
13	Lab Cycle-13	3	13-03-26		DM5	
14	Internal exam	3	27-03-06		DM5	

PART-C

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**P.Mary Kamala Kumari**	**Dr. Ch. Venkata Narayana**	**Dr.D.Venkata Subbaiah**	**Dr.S. Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. P Rajasekhar
Course Name & Code : Database Management Systems Lab (23CS56)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-D A.Y: 2025-26

Pre-Requisites : Data Structures and Operating Systems

COURSE EDUCATIONAL OBJECTIVES (CEOs):: This Course will enable students to

1. Populate and query a database using SQL DDL/DML Commands
2. Declare and enforce integrity constraints on a database
3. Writing Queries using advanced concepts of SQL
4. Programming PL/SQL including procedures, functions, cursors and triggers

COURSE OUTCOMES (COs): At the end of the course, students can

CO 1	Implement SQL queries using DDL/DML commands.(Apply-L3)
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. (Apply-L3)
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. .(Apply-L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
C04	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using the SELECT command	3+3	03-12-2025 10-12-2025		TLM4	
2	Queries (along with sub-Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example: - Select the roll number and name of the student who secured fourth rank in the class	3	17-12-2025		TLM4	
3	Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views	3	24-12-2025		TLM4	
4	Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)	3	31-12-2025		TLM4	
5	Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks	3	07-01-2026		TLM4	

	can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)					
6	Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block	3	21-01-2026		TLM4	
7	Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions	3	04-02-2026		TLM4	
8	Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR	3	11-02-2026		TLM4	
9	Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES	3	18-02-2026		TLM4	
10	Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions	3	25-02-2026		TLM4	
11	Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.	3	11-03-2026		TLM4	
12	Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers	3	18-03-2026		TLM4	
13	Case studies	3	25-03-2026		TLM4	

13	Internal Exam	3	01-04-2026			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. P Rajasekhar**	**Dr. M. Srinivasa Rao**	**Dr. Y V Bhaskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. SRINIVASA REDDY

Course Name & Code : Full Stack Development-I & 23CSS2

L-T-P Structure : **0-1-2** **Credits:** 2

Program/Sem/Sec : B.Tech-CSE/IV/D **A.Y.:** 2025-26

PREREQUISITE: Knowledge of Basic Computer Hardware & Software.

COURSE EDUCATIONAL OBJECTIVE: The main objectives of the course are to

- Make use of HTML elements and their attributes for designing static web pages.
- Build a web page by applying appropriate CSS styles to HTML elements.
- Experiment with JavaScript to develop dynamic web pages and validate form.

COURSE OUTCOMES: After successful completion of the course the students are able to

CO1	Design static web pages by using HTML elements. (Apply-L3)
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. (Apply-L3)
CO3	Develop dynamic web pages and validate forms using JavaScript. (Apply-L3)
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Method	HOD Sign
1.	**Introduction to FSD-I**	3	02-12-2025		DM5	
2.	**Lab Cycle-1:** Lists, Links and Images	3	09-12-2025		DM5	
3.	**Lab Cycle-1:** Lists, Links and Images	3	16-12-2025		DM5	
4.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	23-12-2025		DM5	
5.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	30-12-2025		DM5	
6.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	06-01-2026		DM5	
7.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	20-01-2026		DM5	
8.	**Lab Cycle-4:** Selector forms	3	03-02-2026		DM5	
9.	**Lab Cycle-4:** Selector forms	3	10-02-2026		DM5	
10.	**Lab Cycle-5:** CSS with Color, Background, Font, Text and CSS Box Model	3	17-02-2026		DM5	
11.	**Lab Cycle-6:** Applying JavaScript - internal and external, I/O, Type Conversion	3	24-02-2026		DM5	
12.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	03-03-2026		DM5	
13.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	10-03-2026		DM5	
14.	**Lab Cycle-8:** Java Script Conditional Statements and Loops.	3	17-03-2026		DM5	
15.	**Lab Cycle-9:** Java Script Functions and Events	3	24-03-2026		DM5	
16.	**Internal Exam**		31-03-2026			

Teaching Learning Method			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/ Field Work
DM3	Tutorial	**DM6**	Web Based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S.Srinivasa Reddy	Dr. S. Nagarjuna Reddy	Dr. Y. Vijaya Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. B. Siva Rama Krishna
Regulation : R23
L-T-P Structure : 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – C Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Friday (from 9.00 AM – 12.00 PM)

S. No	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–I Introduction to Design Thinking,** Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components	3	05-12-25		TLM2/ TLM4	
02	Principles of design	3	12-12-25		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	19-12-25		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	26-12-25		TLM1	
05	Design thinking in social innovations. Tools of design thinking - person, costumer	3	02-01-26		TLM2	
06	journey map, brainstorming, product development (Activity)	3	09-01-26		TLM4	
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	23-01-26			
08	Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.	3	06-02-26		TLM2/ TLM4	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate	3	13-02-26		TLM4	

	on value-based innovation					
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	20-02-26		TLM1/ TLM4	
11	Product planning, product specifications. Innovation towards product design Case studies.	3	27-02-26		TLM2	
12	**Activity:** Importance of modeling, how to set specifications, Explaining their own product design	3	06-03-26		TLM4	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	13-03-26		TLM1/ TLM4	
14	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	27-03-06		TLM4	
II Mid Exams: 05-12-2025 to 12-03-2026						
No. of classes required to complete: 42				**No. of classes taken:**		

PART-C

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr B Sivaramakrishna**	**Dr.D.Venkata Subbaiah**	**Dr.D.Venkata Subbaiah**	**Dr.S. Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in,
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.G.V.Suresh
Course Name & Code **:** 23QT01 – Survey of Quantum Technologies and Applications
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Quantum Physics, DLD, Network Security

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course is meant to give an overview of the field of quantum technologies and make the students familiar with state-of-the-art in all four verticals. The emphasis is not on depth in this course, but on covering the exciting aspects of the field. The general physical principles of realizing qubits for computation

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Summarize the foundational concepts of quantum physics quantum states, wavefunctions, superposition, tunneling, and entanglement and outline their relevance to quantum technologies. (**L2–Understand**)
CO2	Apply the principles of qubits and basic quantum gates to construct simple quantum circuits and identify key quantum algorithms and physical qubit platforms. **(L3–Apply)**
CO3	Apply the principles of quantum sensing to interpret the functioning of devices such as atomic clocks, gravimeters, and quantum magnetometers. **(L3–Apply)**
CO4	Summarize the key ideas of quantum communication and differentiate fiber-based, free-space, and satellite quantum links with respect to security and performance. **(L2–Understand)**
CO5	Classify major quantum materials including topological insulators, superconductors, Mott insulators, and 2D materials and outline their applications in quantum technologies. **(L2–Understand)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	2	2	1	1	1	1	2	1	3	2	1	1
CO2	3	3	2	2	3	1	1	1	1	2	1	3	3	2	1
CO3	3	3	2	3	3	1	1	1	1	2	1	3	2	1	1
CO4	3	3	1	2	3	2	1	2	1	3	1	3	2	2	1
CO5	3	3	2	2	2	1	2	1	1	2	1	3	2	2	2
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Quantum Information Science – Manenti R., Motta M., 1st Edition, Oxford University Press (2023)
T2	Quantum computation and quantum information – Nielsen M. A., and Chuang I. L., 10th Anniversary edition, Cambridge University Press (2010)

REFERENCE BOOKS:

R1	Elements of Quantum Computation and Quantum Communication, A. Pathak, Boca Raton, CRC Press (2015)
R2	An Introduction to Quantum Computing, Phillip Kaye, Raymond Laflamme, and Michele Mosca, Oxford University Press (2006)
R3	Quantum computing explained, David McMahon, Wiley (2008)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Quantum Technologies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
UNIT-I						
1.	Introduction to Quantum Technologies – Four Verticals; Motivation for Quantum Technologies;	1	04-12-2025		TLM1, 2	
2.	Quantum States; Wavefunctions;	1	05-12-2025		TLM1, 2	
3.	Probabilistic Interpretation; Physical Observables;	1	06-12-2025		TLM1, 2	
4.	Hermitian Operators; Expectation Values; Heisenberg Uncertainty Principle; Schrödinger Equation;	1	11-12-2025		TLM1, 2	
5.	Time Evolution; Distinction from Classical Physics; Superposition; Tunnelling; Entanglement	1	12-12-2025		TLM1, 2	
6.	No-Cloning Theorem; Simulating Classical Systems; Feynman's Quantum Simulator Idea	1	13-12-2025		TLM1, 2	
No. of classes required to complete UNIT-I: 6				**No. of classes taken:**		

UNIT-II: Quantum Computation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	Basics of Qubits – What is a Qubit?; Difference Between Classical Bits and Qubits	1	18-12-2025		TLM1,2	
8.	Review of Classical Logic Gates; Basics of Qubit Gates; Quantum Circuits; Physical implementation of Qubits; Semiconducting Qubits – Quantum Dots	1	19-12-2025		TLM1,2	
9.	Spin Qubits; Superconducting Qubits – Charge/Flux/Phase; Topological Qubits; Trapped Ions Rydberg Atoms; Neutral Atoms	2	20-12-2025 25-12-2025		TLM1,2	
10.	Photon Qubits – Linear Optical Setups; Integrated Photonics; NMR Qubits; NV Centres	2	26-12-2025 27-12-2025		TLM1,2	
11.	RSA Algorithm; Shor's Algorithm; Quantum Advantage; Long-Term Strategies; Error Correction	2	01-01-2026 02-01-2026		TLM1,2	
No. of classes required to complete UNIT-II:8				**No. of classes taken:**		

UNIT-III: Quantum Sensing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Basics of Quantum Sensing. Single Photon Generation. Entangled Photon Generation. Photon Detection; Gravimetry	3	03-01-2026 08-01-2026 09-01-2026		TLM1,2	
13.	Atomic Clocks; Magnetometry	2	10-01-2026 15-01-2026		TLM1,2	
14.	State of the Art in Quantum; Sensing	3	16-01-2026 17-01-2026 22-01-2026		TLM1,2	
No. of classes required to complete UNIT-III: 6				**No. of classes taken:**		

UNIT-IV: Quantum Communications

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Basics of Digital Communication; Shannon Entropy; Basics of Quantum Communication	3	23-01-2026 24-01-2026 05-02-2026		TLM1,2	
16.	Quantum Security Eavesdropping & Countermeasures; Fibre-Based Quantum Communication	3	06-02-2026 07-02-2026 12-02-2026		TLM1,2	
17.	Free-Space Quantum Communication	3	13-02-2026 14-02-2026 19-02-2026		TLM1,2	
18.	Satellite-Based Quantum Communication	3	20-02-2026 21-02-2026 26-02-2026		TLM1,2	
19.	Achievements in Quantum Communication	3	27-02-2026 28-02-2026 05-03-2026		TLM1,2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Introduction to Quantum Materials

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Introduction to Quantum Materials; Importance of Quantum Materials; Applications – Quantum Computing, Spintronics	3	06-03-2026 07-03-2026 12-03-2026		TLM1,2	
21.	Topological Insulators; Superconductors	3	13-03-2026 14-03-2026 19-03-2026		TLM1,2	
22.	Mott Insulators; 2D Materials Quantum Spin Liquids	3	20-03-2026 21-03-2026		TLM1,2	
No. of classes required to complete UNIT-V: 7				**No. of classes taken:**		

Contents beyond the Syllabus

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.					**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. G. V. Suresh**	**Dr. G. V. Suresh**		**Dr. S. Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. P. SARALA
Course Name & Code : DATABASE MANAGEMENT SYSTEMS & 23CS03
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech IV Sem CSE – E Section **A.Y.:** 2025-26

PREREQUISITE: Data Structures

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Objective of this course is

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the foundation of database management system and various data models. (Understand-L2)
CO2	Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand-L2)
CO3	Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply-L3)
CO4	Apply various normalization techniques for efficient data handling. (Apply-L3)
CO5	Understand Transaction management, recovery & indexing techniques. (Understand-L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low					**2** –Medium						**3** – High				

TEXTBOOKS:

T1 Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)

T2 Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1 Introduction to Database Systems, 8thedition, C J Date, Pearson

R2 Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson

R3 Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DBMS Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, Introduction: An overview of Database Management System	1	02-12-25		1 & 2	
2.	Characteristics (Database Vs File System), Database Users	1	03-12-25		1 & 2	
3.	Advantages of Database Systems, Database Applications	1	04-12-25		1 & 2	
4.	Data Models	1	05-12-25		1 & 2	
5.	Concepts of Schema	1	09-12-25		1 & 2	
6.	Instance and Data Independence	1	10-12-25		1 & 2	
7.	Three tier schema architecture for data independence	1	11-12-25		1 & 2	
8.	Database System Structure and	1	12-12-25		1 & 2	
9.	Environment	1	16-12-25		1 & 2	
10.	Centralized and Client Server architecture for the database	1	17-12-25		1 & 2	
11.	Unit-1 Revision	1	18-12-25		1 & 2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Entity Relationship Model and Relational Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Entity Relationship Model: Introduction	1	19-12-25		1 & 2	
13.	Representation of entities, Attributes and entity set	1	01-01-26		1 & 2	
14.	Relationship and relationship set	1	02-01-26		1 & 2	
15.	Constraints	1	06-01-26		1 & 2	
16.	Sub Classes and Super Class, Inheritance	1	07-01-26		1 & 2	
17.	Specialization and Generalization using ER Diagrams	1	08-01-26		1 & 2	
18.	Relational Model: Introduction to relational model	1	09-01-26		1 & 2	
19.	Concepts of domain, Attribute and Tuple	1	20-01-26		1 & 2	
20.	Relation and importance of null values	1	21-01-26		1 & 2	

21.	Constraints (Domain, Key constraints, Integrity constraints) and their importance	1	22-01-26		1 & 2	
22.	Relational Algebra	1	23-01-26		1 & 2	
23.	Relational Calculus	1	24-01-26		1 & 2	
24.	Unit-II revision	1	03-02-26		1 & 2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: BASIC SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	BASIC SQL: Simple Database schema, data types	1	04-02-26		1 & 2	
26.	Table definitions (create, alter), different DML operations (insert, delete, update)	1	05-02-26		1 & 2	
27.	SQL querying (select and project) using where clause, arithmetic & logical operations	1	06-02-26		1 & 2	
28.	SQL functions (Date and Time, Numeric, String conversion)	1	10-02-26		1 & 2	
29.	Creating tables with relationship, implementation of key and integrity constraints	1	11-02-26		1 & 2	
30.	Nested queries and sub queries	1	12-02-26		1 & 2	
31.	Grouping and Aggregation	1	13-02-26		1 & 2	
32.	Ordering	1	17-02-26		1 & 2	
33.	Implementation of different types of joins	1	18-02-26		1 & 2	
34.	View(updatable and non-updatable)	1	19-02-26		1 & 2	
35.	Relational set operations	1	20-02-26		1 & 2	
36.	Unit-III Revision	1	24-02-26		1 & 2	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	Schema Refinement (Normalization): Purpose of Normalization or schema refinement	1	25-02-26		1 & 2	
38.	Concept of functional dependency	1	26-02-26		1 & 2	
39.	Normal forms based on functional dependency	1	27-02-26		1 & 2	
40.	Lossless join and dependency preserving decomposition	1	03-03-26		1 & 2	
41.	1NF and 2NF	1	05-03-26		1 & 2	
42.	3 NF concept of surrogate key	1	06-03-26		1 & 2	
43.	Concept of surrogate key	1	10-03-26		1 & 2	
44.	BoyceCodd normal form (BCNF)	1	11-03-26		1 & 2	

45.	MVD, Fourth normal form(4NF)	1	12-03-26		1 & 2	
46.	Fifth Normal Form (5NF)	1	13-03-26		1 & 2	
47.	Unit-IV revision	1	17-03-26		1 & 2	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Transaction Processing and Concurrency Control, Introduction to Recovery Protocols and Introduction to Indexing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48.	Transaction Processing and Concurrency Control: Transaction State, ACID properties	1	18-03-26		1 & 2	
49.	Concurrent Executions, Serializability, Recoverability	1	20-03-26		1 & 2	
50.	Implementation of Isolation, Testing for Serializability	1	24-03-26		1 & 2	
51.	Two-Phase Locking Techniques for concurrency control: Types of Locks, Time stamp-based locking	1	25-03-26		1 & 2	
52.	Introduction to Recovery Protocols: Recovery Concepts, No-UNDO/REDO	1	27-03-26		1 & 2	
53.	Recovery Based on Deferred Update, Recovery Techniques Based on Immediate Update	1	31-03-26		1 & 2	
54.	Shadow Paging, ARIES	1	01-04-26		1 & 2	
55.	Introduction to Indexing: Hash based Indexing, Unit-5 revision	1	02-04-26		1 & 2	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Content Beyond Syllabus

S.NO	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes COs	Text Book Followed	HOD Sign
1.	NoSQL Databases	1	04-04-2026					
No. of Classes		1			No. of classes taken:			
II MID EXAMINATIONS 06-04-2026 TO 11-04-2026								

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty				
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Ms. P. SARALA
Course Name & Code : Database Management Systems Lab (23CS56)
L-T-P Structure :0-0-3 **Credits:**1.5
Program/Sem/Sec : B. Tech IV Sem CSE – E Section **A.Y.:** 2025-26

PRE-REQUISITE: Programming language, Discrete Mathematical Structures, and Data Structures.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This Course will enable students to
1. Populate and query a database using SQL DDL/DML Commands
2. Declare and enforce integrity constraints on a database
3. Writing Queries using advanced concepts of SQL
4. Programming PL/SQL including procedures, functions, cursors and triggers

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Implement SQL queries using DDL/DML commands.(**Apply-L3**)
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. (**Apply-L3**)
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. (**Apply-L3**)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical Values

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to SQL, syntax	3	01-12-25		TLM4	
2	Sample Experiments	3	08-12-25		TLM4	
3	Sample Experiments	3	15-12-25		TLM4	
4	Sample Experiments	3	22-12-25		TLM4	
5	Sample Experiments	3	29-12-25		TLM4	
6	Sample Experiments	3	05-01-26		TLM4	
7	Case study 1	3	19-01-26		TLM4	
8	Case study 1	3	02-02-26		TLM4	
9	Case study 1	3	09-02-26		TLM4	
10	Case study 2	3	16-02-26		TLM4	
11	Case study 2	3	23-02-26		TLM4	
12	Case study 2	3	02-03-26		TLM4	
13	Case study 3	3	09-03-26		TLM4	
14	Case study 3	3	16-03-26		TLM4	
15	Case study 3	3	23-03-26		TLM4	
16	Internal Exam	3	30-03-26		TLM4	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	Marks
Day to Day Work	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Vice-voce	20

Semester End Examination(SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
PSO 2	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
PSO 3	To provide a concrete foundation and enrich their abilities for employment and Higher studies in Artificial Intelligence and Data Science with ethical values.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty				
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor **:** Dr. D.Venkata Subbaiah & Mrs.G.V.Rajya Lakshmi
Regulation : R23
L-T-P Structure **:** 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – E Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Saturday (from 9.00 AM – 12.00 PM)

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–I Introduction to Design Thinking,** Introduction to elements and principles of Design,	3	04-12-2025		TLM2/ TLM4	
02	basics of design-dot, line, shape, form as fundamental design components, Principles of design	3	11-12-2021		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	18-12-2025		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	08-01-2026		TLM1	
05	Design thinking in social innovations. Tools of design thinking - person,	3	22-01-2025		TLM2	

	costumer, journey map, brainstorming, product development (Activity)					
I Mid Exams: 26-01-2026 to 31-02-2026						
06	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and Innovation in organizations, Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.	3	05-02-2026		TLM2/ TLM4	
07	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	12-02-2026		TLM4	
08	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.	3	19-02-2026		TLM1/ TLM4	
09	**Activity:** Importance of modeling, how to set specifications,Explaining their own product design	3	26-02-2026		TLM4	
10	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business, Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme	3	05-03-2026		TLM1/ TLM4	

	competition, Standardization					
11	Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.	3	12-03-2026		TLM1/ TLM4	
12	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	02-04-2026		TLM4	
II Mid Exams: 06-04-2026 to 11-04-2026						
No. of classes required to complete: 36				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-B

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Signature				
Name of the Faculty	Dr. D. Venkata Subbaiah, Mrs.G.V.Rajya Lakshmi	Dr.V.Ramakrishna	Dr.K.Devi Priya	Dr. S.Nagarjuna Reddy
Designation	**Course Instructors**	**Course Coordinator**	**Module Coordinator**	**HoD**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., IV-Sem., CSE-E
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE : 2-0-0
COURSE CREDITS : 0
COURSE INSTRUCTOR : Dr. V. Bhagya Lakshmi
COURSE COORDINATOR : Dr. V. Bhagya Lakshmi
PRE-REQUISITES : Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.

R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.

R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.

R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.

R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.

R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.

R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	01-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	05-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	08-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	12-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	15-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	19-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	22-12-2025					
No. of classes required to complete UNIT-I		06			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	26-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	29-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids	1	02-01-2026		TLM1	CO2	T1,T2	
11.	Types of ecosystems	1	05-01-2026		TLM1	CO2	T1,T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	09-01-2026		TLM1	CO2	T1,T2	
13.	Values of Biodiversity, India as mega diversity nation	1	16-01-2026		TLM1	CO2	T1,T2	

14.	Threats to biodiversity and Conservation of biodiversity	1	19-01-2026		TLM1	CO2	T1,T2	
15.	Revision	1	23-01-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
16.	Environmental pollution -Air pollution	1	02-02-2026		TLM1	CO3	T1,T2	
17.	Water pollution, Marine pollution, Thermal pollution	1	06-02-2026		TLM1	CO3	T1,T2	
18.	Soil pollution	1	09-02-2026		TLM1	CO3	T1,T2	
19.	Noise pollution & Nuclear Hazards	1	13-02-2026		TLM1	CO3	T1,T2	
20.	Solid waste management	1	16-02-2026		TLM1	CO3	T1,T2	
21.	Disaster management	1	20-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
22.	From Unsustainable to Sustainable development	1	23-02-2026		TLM1	CO4	T1,T2	
23.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	27-02-2026		TLM1	CO4	T1,T2	
24.	Environmental ethics, Climate change	1	02-03-2026		TLM1	CO4	T1,T2	
25.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	06-03-2026		TLM1	CO4	T1,T2	
26.	Environmental Acts	1	09-03-2026		TLM1	CO4	T1,T2	
27.	Environmental Acts	1	13-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	16-03-2026		TLM1	CO5	T1,T2	
29.	Environment and human health –Human Rights – Value Education	1	20-03-2026		TLM1	CO5	T1,T2	
30.	HIV/AIDS – Women and Child Welfare	1	23-03-2026		TLM1	CO5	T1,T2	
31.	Role of information Technology in Environment and human health	1	27-03-2026		TLM1	CO5	T1,T2	
32.	Revision	1	30-03-2026		TLM3	CO5	T1,T2	
33.	Revision	1	03-04-2026		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		06			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Case studies	2	23-01-2026 20-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. V. Bhagya Lakshmi	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)
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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor : Dr. G.Minni

Course Name & Code : FULL SATCK DEVELOPMENT-I 23CSS2

L-T-P Structure : 0-1-2 Credits:2

Program/Sem/Sec : B.Tech.–CSE /IV-Sem/E A.Y. :2025-26

PRE-REQUISITE: Knowledge of basic Computer hardware & software

COURSE EDUCATIONAL OBJECTIVE (CEO): The course aims to give students hands – on experience and train them to make use of HTML elements and their attributes for designing static web pages

•Build a web page by applying appropriate CSS styles to HTML elements

•Experiment with JavaScript to develop dynamic web pages and validate forms

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Design static web pages by using HTML elements.	Apply–Level3
CO2:	Develop a web page by applying appropriate CSS styles to HTML elements.	Apply–Level3
CO3:	Develop dynamic web pages and validate forms using JavaScript.	Apply–Level3
CO4:	Improve individual / teamwork skills, communication & report writing skills with ethical values	Apply–Level3

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 –Low								**2** –Medium					**3**– High		

TEXT BOOKS:

T1	Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
T2	Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
T3	Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

PART-B

COURSE DELIVERY PLAN -LESSONPLAN:

S No.	Programs to be covered	No. of Classes		Actual Date of Completion	Delivery Method	HOD Sign.
		Required as per the Schedule	Tentative Date of Completion			
1.	Week 1: 1. Lists, Links and Images.	03	03-12-2025		DM5	
2.	Week 2: 1. Lists, Links and Images.	03	10-12-2025		DM5	
3.	Week 3: 2.HTML Tables, Forms and Frames	03	17-12-2025		DM5	
4.	Week 4: 2.HTML Tables, Forms and Frames.	03	24-12-2025		DM5	
5.	Week 5: 3.HTML 5 and Cascading Style Sheets, Types of CSS	03	31-12-2025		DM5	
6.	Week 6: 4.Selector forms	03	07-01-2026		DM5	
7.	Week 7: 5. CSS with Color, Background, Font, Text and CSS Box Model	03	21-01-2026		DM5	
8.	Week 8: 5. CSS with Color, Background, Font, Text and CSS Box Model	03	04-02-2026		DM5	
9.	Week 9: 7.Java Script Pre-defined and User-defined Objects.	03	11-02-2026		DM5	
10.	Week10: 7.Java Script Pre-defined and User-defined Objects.	03	18-02-2026		DM5	
11.	Week 11: .8.Java Script Conditional Statements and Loops	03	25-02-2026		DM5	
12.	Week 12: 8.Java Script Conditional Statements and Loops	03	11-03-2026		DM5	
13.	Week 13: 9. Java Script Functions and Events	03	18-03-2026		DM5	
14.	Week 14: 9. Java Script Functions and Events	03	25-03-2026		DM5	
15.	Lab Internal Test	03	01-04-26		DM5	

Delivery Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	**100**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management** and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications..

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. G. Minni	Dr. S. Nagarjuna Reddy	Dr. Y. V. B. Reddy	Dr. S. Nagarjuna Reddy
Signature				

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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE-E
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Ms.PATHAN KALMA BEGUM
COURSE COORDINATOR : Dr. D. VIJAY KUMAR
PRE-REQUISITES : Basics of mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.

2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	1/12/2025		TLM1	CO1	T1, T2	
2.	Syllabus Co's, PO's	1	05/12/2025		TLM1	CO1	T1, T2	
3.	Unit-1, Introduction to data science	1	05/12/2025		TLM1	CO1	T1, T2	
4.	Statistics- Population and sample, Collection of data,	1	06/12/2025		TLM1	CO1	T1, T2	
5.	Types of variables	1	8/12/2025		TLM1	CO1	T1, T2	
6.	Data visualization	1	12/12/2025		TLM1	CO1	T1, T2	
7.	Measures of central tendency, A.M	1	12/12/2025		TLM1	CO1	T1, T2	
8.	Median, mode problems	1	13/12/2025		TLM1	CO1	T1, T2	
9.	Measures of variability Range	1	15/12/2025		TLM1	CO1	T1, T2	
10.	Mean deviation	1	19/12/2025		TLM1	CO1	T1, T2	
11.	S.D. & Q D	1	19/12/2025		TLM1	CO1	T1, T2	
12.	Skewness	1	20/12/2025		TLM1	CO1	T1, T2	
13.	Kurtosis	1	22/12/2025		TLM1	CO1	T1, T2	
14.	Tutorial	1	26/12/2025		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Correlation, types	1	26/12/2025		TLM1	CO2	T1, T2	
16.	Coefficient of correlation	1	27/12/2025		TLM1	CO2	T1, T2	
17.	Rnak correlation	1	29/12/2025		TLM1	CO2	T1, T2	
18.	Linear regression (lines)	1	02/12/2025		TLM1	CO2	T1, T2	
19.	Problems	1	02/01/2026		TLM1	CO2	T1, T2	
20.	Multiple regression	1	05/01/2026		TLM1	CO2	T1, T2	

21.	Regression coefficients	1	09/01/2026		TLM1	CO2	T1, T2	
22.	Tutorial II	1	09/01/2026		TLM1	CO2	T1, T2	
23.	Fitting of parabola	1	10/01/2026		TLM1	CO2	T1, T2	
24.	Exponential curve	1	19/01/2026		TLM1	CO2	T1, T2	
25.	Fitting of power curve	1	23/01/2026		TLM1	CO2	T1, T2	
26.	Tutorial III	1	23/01/2026		TLM3	CO2	T1, T2	
27.	Problems Revision	1	24/01/2026		TLM1	CO2	T1, T2	
No. of classes required to complete UNIT-II		13			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Probability, Introduction	1	02/02/2026		TLM1	CO3	T1, T2	
29.	Conditional probability	1	06/02/2026		TLM1	CO3	T1, T2	
30.	TUTORIAL IV	1	06/02/2026		TLM3	CO3	T1, T2	
31.	Bayes theorem	1	07/02/2026		TLM1	CO3	T1, T2	
32.	Random variables, Distribution function	1	9/02/2026		TLM1	CO3	T1, T2	
33.	Probability mass function	1	13/02/2026		TLM1	CO3	T1, T2	
34.	TUTORIAL -V		13/02/2026					
35.	Probability density function	1	14/02/2026		TLM1	CO3	T1, T2	
36.	Mathematical expectation, variance	1	16/02/2026		TLM3	CO3	T1, T2	
37.	Binomial distribution	1	20/02/2026		TLM1	CO3	T1, T2	
38.	Poisson distribution	1	20/02/2026		TLM1	CO3	T1, T2	
39.	Normal distribution	1	21/02/2026		TLM1	CO3	T1, T2	
40.	Uniform distribution	1	23-02-20206		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV: Sampling Theory

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
41	Introduction: population & sample Sampling distribution	1	27/02/2026		TLM1	CO4	T1, T2	
42	TUTORIAL-V	1	27/02/2026		TLM1	CO4	T1, T2	

43	Sampling distribution of means & variance	1	28/02/2026		TLM1	CO4	T1, T2	
44	Central limit theorem	1	02/03/2026		TLM3	CO4	T1, T2	
45	Estimation- point & interval, maximum error	1	06/03/2026		TLM1	CO4	T1, T2	
46	TUTORIAL-VI	1	06/03/2026		TLM1	CO4	T1, T2	
47	Estimation using t-distribution	1	7/03/2026		TLM3	CO4	T1, T2	
48	Estimation using F-distribution	1	9/03/2026		TLM1	CO4	T1, T2	
49	Estimation using χ^2 −distribution	1	13/03/2026		TLM1	CO4	T1, T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Tests of Hypothesis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50	Hypothesis: introduction, Definitions	1	13/03/2026		TLM1	CO5	T1, T2	
51	Z-test for single mean	1	14/03/2026		TLM1	CO5	T1, T2	
52	Z-test for diff. of mean	1	16/03/2026		TLM3	CO5	T1, T2	
53	Z-test for single proportion, difference of proportion	1	20/03/2026		TLM1	CO5	T1, T2	
54	TUTORIAL-VII	1	20/03/2026		TLM1	CO5	T1, T2	
55	t-test for single mean, diff. means	1	23/03/2026		TLM1	CO5	T1, T2	
56	F-test for variances	1	27/03/2026		TLM1	CO5	T1, T2	
57	TUTORIAL-VIII	1	27/03/2026		TLM1	CO5	T1, T2	
58	χ^2 −test for goodness of fit	1	28/03/2026		TLM1	CO5	T1, T2	
59	χ^2 −test for independence	1	04/04/2026		TLM1	CO5	T1, T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
60	Paired t-test	1	30/03/2026		TLM1	CO5	T1, T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (6-4-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)

TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Ms. P. Kalma Begum	**Dr. D. Vijay Kumar**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.Swanth
Course Name & Code : Mathematical Foundations for Security -23CSH1
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/A-G-sec(Honors) **A.Y.:** 2025-26

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

- To understand the mathematical fundamentals in probabilistic and statistical concepts
- To develop the understanding of the mathematical and logical basis of various modern techniques in information technology like machine learning, programming language design, and concurrency.
- To study various Graph Theory problems.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the basic notions of discrete and continuous probability (Understand-L2)
CO2	Apply the methods of statistical inference, and learn application of sampling distributions in Data mining and Machine Learning.(Apply-L3)
CO3	Apply statistical analysis to algorithmic problems of simple to moderate complexity in different domains (Apply-L3)
CO4	Model different applications of Computer science as graph theory problems (Apply-L3)
CO5	Evaluate modular exponentiation for cryptographic applications. (Evaluate-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low **2 –**Medium **3 -** High															

Text Books:

1. **John Vince, Foundation Mathematics for Computer Science, Springer, 2015.**
2. **K. Trivedi, Probability and Statistics with Reliability, Queuing, and Computer Science Applications, Wiley, 2001.**

Reference Books:

1. M. Mitzenmacher and E. Upfal, Probability and Computing: Randomized Algorithms and Probabilistic Analysis, 2005.

2. Alan Tucker, Applied Combinatorics, Wiley, 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Cyber Security	1	04-12-2025		TLM2	
2.	Density, and cumulative distribution functions	1	05-12-2025		TLM2	
3.	Expected value, conditional expectation	1	06-12-2025		TLM2	
4.	Problems	1	11-12-2025		TLM2	
5.	Applications of the univariate and multivariate Central Limit Theorem	1	12-12-2025		TLM2	
6.	Probabilistic inequalities	1	13-12-2025		TLM2	
7.	Probabilistic inequalities problems	1	18-12-2025		TLM2	
8.	Probabilistic inequalities, Markov chains	1	19-12-2025		TLM2	
9.	Markov chains	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 9				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Random samples	1	26-12-2025		TLM2	
11.	Problems on Random samples	1	27-12-2025		TLM2	
12.	sampling distributions of estimators	1	2-1-2026		TLM2	
13.	Problems on sampling distributions of estimators	1	3-1-2026		TLM2	
14.	Maximum Likelihood	1	08-01-2026		TLM2	
15.	Problems on Maximum Likelihood	1	09-01-2026 10-01-2026		TLM2	
16.	Revision	1	10-01-2026		TLM2	
17.	Unit Test-2	1	24-01-2026		TLM2	
No. of classes required to complete UNIT-II: 8				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Statistical inference	1	05-02-2026		TLM1	
19.	Introduction to multivariate statistical models	1	06-02-2026		TLM1	
20.	classification problems	1	07-02-2026		TLM1	
21.	principal component analysis	1	12-02-2026		TLM1	
22.	The problem of over fitting model assessment	1	13-02-2026		TLM1	
23.	Problems on to multivariate statistical models	1	14-02-2026		TLM1	
24.	Problems on principal component analysis	1	19-02-2026		TLM1	
25.	Unit Test-3	1	20-02-2026		TLM1	
No. of classes required to complete UNIT-III: 8						

UNIT-IV

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Isomorphism	1	21-02-2026		TLM1	
27.	Planar graphs, graph coloring	1	26-02-2026		TLM1	
28.	Hamilton circuits and Euler cycles	1	27-02-2026		TLM1	
29.	Permutations and Combinations with and without repetition	1	28-02-2026		TLM1	
30.	Specialized techniques to solve combinatorial enumeration problems	1	05-03-2026		TLM1	
31.	Problems on Isomorphism	1	06-03-2026		TLM1	
32.	Unit Test-4	1	07-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 7				**No. of classes taken:**		

UNIT-V

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Elementary number theory	1	12-03-2026		TLM2	
34.	Unique factorization	1	13-03-2026		TLM2	
35.	Euler's function	1	14-03-2026		TLM2	
36.	Modular arithmetic	1	20-03-2026		TLM2	
37.	Fermat's little theorem,	1	21-03-2026		TLM2	
38.	Chinese remainder theorem	1	26-03-2026		TLM2	
39.	modular exponentiation	1	28-03-2026		TLM2	
40.	Tutorial on File Sharing.	1	26-03-2026		TLM2	
41.	Unit Test-5	1	28-03-2026		TLM2	
No. of classes required to complete UNIT-V: 9				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr B.Swanth**	**Dr.B.Swanth**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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College Code: 76

MASTER OF BUSINESS ADMINISTRATION
COURSE HANDOUT

PART-A

Name of Course Instructor : **M r s J . D I V Y A**
Course Name & Code : **MEFA-23HS02**
L-T-P Structure : 2-0-0 Credits: 2
Program/Sem/Sec : CSE AIDS(E/Sec)., II-Sem. A. Y : 2025-26
Prerequisite: Basic Knowledge in business activities.

COURSE EDUCATIONAL OBJECTIVES(CEO):
- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate the capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3														
CO2	3	2													
CO3			2												
CO4				2		2									
CO5					2										
1 - Low				**2 –**Medium							**3 -** High				

Textbooks:
1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:
1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Business Economics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completeon	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Orientation	1	02/12/25		TLM1	CO1	T1,R2	
2.	Orientation	1	04/12/25		TLM1	CO1	T1,R2	
3.	Introduction to Economics	1	05/12/25		TLM1	CO1	T1,R2	
4.	Explaining about Managerial Economics	1	09/12/25		TLM1	CO1	T1,R2	
5.	Definitions of Economics- Nature and Scope of Economics	1	11/12/25		TLM1	CO1	T1,R2	
6	Demand-Law of demand	1	12/12/25		TLM1	CO1	T1,R2	
7	Elasticity of demand	1	16/12/25		TLM1	CO1	T1,R2	
8	Types of Elasticity of demand	1	18/12/25		TLM1	CO1	T1,R2	
9	Demand Forecasting - Methods of demand forecasting	1	19/12/25		TLM3	CO1	T1,R2	
No. of classes required to complete UNIT-I		09		No. of classes taken:				

UNIT-II: Theory of Production and Cost analysis

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Production Function	1	23/12/2025		TLM1	CO2	T1,R2	
2.	Isoquant and Isocost	1	26/12/2025		TLM1	CO2	T1,R2	
3.	Least Cost Combination of inputs	1	27/12/2025		TLM1	CO2	T1,R2	
4.	Law of Returns	1	30/01/2026		TLM1	CO2	T1,R2	
5.	Internal and External Economies of Scale	1	01/01/2026		TLM1	CO2	T1,R2	
6.	Cost Concepts	1	06/01/2026		TLM1	CO2	T1,R2	
7.	Break-even Analysis	1	08/01/2026		TLM1	CO2	T1,R2	
No. of classes required to complete UNIT-II		07		No. of classes taken:				

UNIT-III: Markets & Pricing Policies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Market structures	1	09/01/2026		TLM1	CO3		
2.	Markets-Types of markets	1	13/01/2026		TLM1	CO3		
3.	Features and price out determinations under Perfect competition	1	15/01/2026		TLM1	CO3		
4.	Features and price out determinations under Monopoly	1	16/01/2026		TLM1	CO3		
5.	Features and price out determinations under Monopolistic competition	1	17/01/2026		TLM1	CO3	T2,R4	
6.	Pricing –Pricing polices & its Objectives	1	20/01/2026		TLM1	CO3		
7.	Pricing Methods and its applications in business.	1	22/01/2026		TLM2	CO3		
8.	I MID EXAMS	1	23/01/2026		TLM1	CO3		
9.	I MID EXAMS	1	27/01/2026		TLM1	CO3		
10.	I MID EXAMS	1	29/01/2026		TLM1	CO3	T2,R4	
11.	I MID EXAMS	1	30/01/2026		TLM2	CO3	T2,R4	
No. of classes required to complete UNIT-III		11		No. of classes taken:				

UNIT-IV: Capital and Capital Budgeting

S. No.	Topics to be covered	No. of Classes Requi red	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcom e COs	Text Book followed	HOD Sign Weekly
1.	Nature and its significance	1	03/02/2026		TLM2	CO4	T2,R4	
2.	Types of Capital	1	05/02/2026		TLM2	CO4	T2,R4	
3.	Sources of raising capital	1	06/02/2026		TLM1	CO4	T2,R4	
4.	Capital budgeting Significance	1	10/02/2026		TLM1	CO4	T2,R4	
5.	Capital budgeting Process	1	12/02/2026		TLM1	CO4	T2,R4	
6.	Techniques of Capital Budgeting	1	13/02/2025		TLM1	CO4	T2,R4	
7	(non-discounted cash flow techniques and discounted cash flow of techniques).	1	17/02/2025		TLM1	CO4	T2,R4	
No. of classes required to complete UNIT-IV		07		No. of classes taken:				

UNIT-V: Financial Accounting and analysis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcom e COs	Text Book followed	HOD Sign Week ly
1.	Accounting significance	1	19/02/2026		TLM1	CO5	T2,R4	
2.	Book Keeping	2	20/02/2026 24/02/2026		TLM1	CO5	T2,R4	
3.	-Double entry system	2	26/02/2026 27/02/2026		TLM1	CO5	T2,R4	
5	Journal entries	2	03/03/2026 05/03/2026		TLM1	CO5	T2,R4	
6.	Journal entries	2	06/03/2026 10/03/2026		TLM1	CO5	T2,R4	
7	Journal	2	12/03/2026 13/03/2026		TLM1	CO5	T2,R4	
8	Ledger	2	17/03/2026 19/03/2026		TLM1	CO5	T2,R4	
9	Trial Balance	2	20/03/2026 24/03/2026		TLM1	CO5	T2,R4	
10	Final Accounts with simple adjustments	2	26/03/2026 27/03/2026		TLM1	CO5	T2,R4	
11	Financial Statement Analysis through ratios	2	02/03/2026 03/04/2026		TLM1	CO5	T2,R4	
08.	II Mid exams				TLM1	CO5	T2,R4	
09.	II Mid exams		-		TLM1	CO5	T2,R4	
1	II Mid exams		-		TLM1	CO5	T2,R4	

0								
1.	II Mid exams		06/04/2025					
No. of classes required to complete UNIT-V		11		No. of classes taken:				

Content beyond syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completeon	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Week ly
1.	Financial accounting	1	02/03/2026					
2.	Behavioral economics	1	03/03/2026					
		02						

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part – C- EVALUATION PROCESS:

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	**A1=5**
I-Descriptive Examination (Units-I, II)	**M1=15**
I-Quiz Examination (Units-I, II)	**Q1=10**
Assignment-II (III, IV & V)	**A2=5**
II- Descriptive Examination (Unit-III, IV & V)	**M2=15**
II-Quiz Examination (Unit-III, IV & V)	**Q2=10**
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	**30**
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	**70**
Total Marks = CIE + SEE	**100**

PART-D: PROGRAMME OUTCOMES (POs) & PROGRAMME SPECIFIC OUTCOMES (PSOs):

Program Outcomes (POs):

PO 1:	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2:	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO 1:	**Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	**VLSI and Embedded Systems:** Design and Analyze Analog and Digital Electronic Circuits or systems and implement real time applications in the field of VLSI and Embedded Systems using relevant tools

PSO 3:	**Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Date:

Mrs. J DIVYA	DR.A .Adisesha Reddy	DR.A .Adisesha Reddy	
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

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An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.SWANTH
Course Name & Code:-OPERATING SYSTEMS Lab&23CS55
L-T-P Structure :0-0-3 **Credits:1.5**
Program/Sem/Sec : II B.TECH-CSE/IV/E-sec **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course are to • Provide insights into system calls, file systems, semaphores,

• Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation

• Implement Bankers Algorithms to Avoid the Dead Lock

• acquire the generic software development skill through various stages of software life cycle

• generate test cases for software testing

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the threads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	3	-	-	-	-	-	-	-	3	3	-
CO2	1	1	1	2	2	-	-	-	-	-	-	-	3	3	2
CO3	2	1	1	2	1	-	-	-	-	-	-	-	3	3	3
CO4	-	-	-	-	-	-	-	2	2	3	-	-	-	-	-
1 - Low **2 –**Medium **3 -** High															

REFERENCE BOOKS:

R1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
R2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
R3	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R4	

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	3	02-12-2025		**DM5**	
2.	Lab Cycle-2	3	09-12-2025		**DM5**	
3.	Lab Cycle -3	3	16-12-2025		**DM5**	
4.	Lab Cycle-4	3	23-12-2025		**DM5**	
5.	Lab Cycle-5	3	29-12-2025		**DM5**	
6.	Lab Cycle-6	3	30-01-2026		**DM5**	
7.	Lab Cycle-7	3	06-01-2026		**DM5**	
8.	Lab Cycle-8	3	20-01-2026		**DM5**	
9.	Lab Cycle-9	3	03-02-2026		**DM5**	
10.	Lab Cycle-10	3	10-02-2026		**DM5**	
11.	Lab Cycle-11	3	17-02-2026		**DM5**	
12.	Lab Cycle -12	3	24-02-2026		**DM5**	
13.	Lab Cycle-13	3	03-03-2026		**DM5**	
14.	Lab Cycle-13	6	10-03-2026 17-03-2026 24-03-2026		**DM5**	
15.	Internal exam	3	31-03-2026			

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr B.Swanth**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.SWANTH
Course Name & Code : Operating Systems -23CS06
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/E-sec **A.Y.:** 2025-26

PREREQUISITE: Computer organization

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

• Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection

• Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.

• Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018

2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS:

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018

2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems & System Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	01-12-2025		TLM2	
2.	operating system functions, operating systems operations	1	02-12-2025		TLM2	
3.	Computing environments, Free and Open-Source Operating Systems.	1	04-12-2025 06-12-2025		TLM2	
4.	Operating System Services, User and Operating-System Interface, system calls,	1	08-12-2025 9-12-2025		TLM2	
5.	Tutorial on Types of System Calls, system programs,	1	11-12-2025 13-12-2025		TLM2	
6.	operating system Design and Implementation	1	15-12-2025		TLM2	
7.	operating system structure,	1	16-12-2025		TLM2	
8.	Tutorial on Building and Booting an Operating System	1	18-12-2025		TLM2	
9.	Operating system debugging.	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Process Concept, Process scheduling	1	22-12-2025		TLM2	
11.	Operations on processes, Inter-process communication	1	23-12-2025		TLM2	
12.	Multithreading models	1	27-12-2025		TLM2	
13.	Thread libraries, Threading issues	1	29-12-2025		TLM2	
14.	CPU Scheduling Basic concepts, Scheduling criteria,	1	30-12-2025 05-01-2026		TLM2	
15.	Scheduling criteria,	1	06-01-2026		TLM2	
16.	Tutorial on Scheduling algorithms,	1	08-01-2026		TLM2	
17.	FCFS,SJF	1	10-01-2026		TLM2	
18.	Priority,round robin	1	19-01-2026 20-01-2026		TLM2	
19.	Tutorial on Multiple processor scheduling.	1	22-01-2026 24-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Synchronization Tools &Deadlocks

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

20.	The Critical Section Problem	1	02-02-2026		TLM1	
21.	Peterson's Solution, Mutex Locks,	1	03-02-2026		TLM1	
22.	Tutorial on Semaphores, Monitors,	1	05-02-2026		TLM1	
23.	Classic problems of Synchronization	1	07-02-2026		TLM1	
24.	system Model, Deadlock characterization,	1	9-02-2026		TLM1	
25.	Tutorial on Methods for handling Deadlocks,	1	10-02-2026		TLM1	
26.	Deadlock prevention	1	12-02-2026		TLM1	
27.	Deadlock avoidance	1	16-02-2026		TLM1	
28.	Tutorial on Deadlock detection,	1	17-02-2026		TLM1	
29.	Recovery from Deadlock.	1	19-02-2026		TLM1	
No. of classes required to complete UNIT-III: 10						

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction of Memory-Management Strategies	1	21-02-2026		TLM1	
31.	Contiguous memory allocation	1	23-02-2026		TLM1	
32.	Tutorial on Paging, Structure of the Page Table, Swapping.	1	24-02-2026		TLM1	
33.	Introduction of Virtual Memory Management	1	26-02-2026		TLM1	
34.	Demand paging, Copy-on-write	1	28-02-2026		TLM1	
35.	Page replacement	1	02-03-2026		TLM1	
36.	Tutorial on Allocation of frames, Thrashing	1	03-03-2026		TLM1	
37.	Introduction of Storage Management	1	05-03-2026		TLM1	
38.	Overview of Mass Storage Structure	1	07-03-2026		TLM1	
39.	HDD Scheduling	1	9-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Tutorial on File concept, Access methods, Directory Structure	1	10-03-2026		TLM2	
41.	File-system structure,	1	12-03-2026		TLM2	
42.	File-system Operations,	1	16-03-2026		TLM2	
43.	Directory implementation,	1	17-03-2026		TLM2	
44.	Allocation method, Free space management	1	23-03-2026		TLM2	
45.	File-System Mounting,	1	24-03-2026		TLM2	

46.	Partitions and Mounting	1	28-03-2026		TLM2	
47.	Tutorial on File Sharing.	1	30-03-2026		TLM2	
48.	Goals of protection,	1	31-03-2026		TLM2	
49.	Principles of protection	1	02-04-2026		TLM2	
50.	Protection Rings,	1	02-04-2026		TLM2	
51.	Domain of protection, Access matrix.	1	04-04-2026		TLM2	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web application and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr.B.Swanth**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.G.V.Suresh
Course Name & Code **:** 23QT01 – Survey of Quantum Technologies and Applications
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Quantum Physics, DLD, Network Security

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course is meant to give an overview of the field of quantum technologies and make the students familiar with state-of-the-art in all four verticals. The emphasis is not on depth in this course, but on covering the exciting aspects of the field. The general physical principles of realizing qubits for computation

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Summarize the foundational concepts of quantum physics quantum states, wavefunctions, superposition, tunneling, and entanglement and outline their relevance to quantum technologies. (**L2–Understand**)
CO2	Apply the principles of qubits and basic quantum gates to construct simple quantum circuits and identify key quantum algorithms and physical qubit platforms. **(L3–Apply)**
CO3	Apply the principles of quantum sensing to interpret the functioning of devices such as atomic clocks, gravimeters, and quantum magnetometers. **(L3–Apply)**
CO4	Summarize the key ideas of quantum communication and differentiate fiber-based, free-space, and satellite quantum links with respect to security and performance. **(L2–Understand)**
CO5	Classify major quantum materials including topological insulators, superconductors, Mott insulators, and 2D materials and outline their applications in quantum technologies. **(L2–Understand)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	2	2	1	1	1	1	2	1	3	2	1	1
CO2	3	3	2	2	3	1	1	1	1	2	1	3	3	2	1
CO3	3	3	2	3	3	1	1	1	1	2	1	3	2	1	1
CO4	3	3	1	2	3	2	1	2	1	3	1	3	2	2	1
CO5	3	3	2	2	2	1	2	1	1	2	1	3	2	2	2
1 - Low			**2 –**Medium								**3 -** High				

TEXTBOOKS:

T1	Quantum Information Science – Manenti R., Motta M., 1st Edition, Oxford University Press (2023)
T2	Quantum computation and quantum information – Nielsen M. A., and Chuang I. L., 10th Anniversary edition, Cambridge University Press (2010)

REFERENCE BOOKS:

R1	Elements of Quantum Computation and Quantum Communication, A. Pathak, Boca Raton, CRC Press (2015)
R2	An Introduction to Quantum Computing, Phillip Kaye, Raymond Laflamme, and Michele Mosca, Oxford University Press (2006)
R3	Quantum computing explained, David McMahon, Wiley (2008)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Quantum Technologies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
UNIT-I						
1.	Introduction to Quantum Technologies – Four Verticals; Motivation for Quantum Technologies;	1	04-12-2025		TLM1, 2	
2.	Quantum States; Wavefunctions;	1	05-12-2025		TLM1, 2	
3.	Probabilistic Interpretation; Physical Observables;	1	06-12-2025		TLM1, 2	
4.	Hermitian Operators; Expectation Values; Heisenberg Uncertainty Principle; Schrödinger Equation;	1	11-12-2025		TLM1, 2	
5.	Time Evolution; Distinction from Classical Physics; Superposition; Tunnelling; Entanglement	1	12-12-2025		TLM1, 2	
6.	No-Cloning Theorem; Simulating Classical Systems; Feynman's Quantum Simulator Idea	1	13-12-2025		TLM1, 2	
No. of classes required to complete UNIT-I: 6				**No. of classes taken:**		

UNIT-II: Quantum Computation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	Basics of Qubits – What is a Qubit?; Difference Between Classical Bits and Qubits	1	18-12-2025		TLM1,2	
8.	Review of Classical Logic Gates; Basics of Qubit Gates; Quantum Circuits; Physical implementation of Qubits; Semiconducting Qubits – Quantum Dots	1	19-12-2025		TLM1,2	
9.	Spin Qubits; Superconducting Qubits – Charge/Flux/Phase; Topological Qubits; Trapped Ions Rydberg Atoms; Neutral Atoms	2	20-12-2025 25-12-2025		TLM1,2	
10.	Photon Qubits – Linear Optical Setups; Integrated Photonics; NMR Qubits; NV Centres	2	26-12-2025 27-12-2025		TLM1,2	
11.	RSA Algorithm; Shor's Algorithm; Quantum Advantage; Long-Term Strategies; Error Correction	2	01-01-2026 02-01-2026		TLM1,2	
No. of classes required to complete UNIT-II:8				**No. of classes taken:**		

UNIT-III: Quantum Sensing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Basics of Quantum Sensing. Single Photon Generation. Entangled Photon Generation. Photon Detection; Gravimetry	3	03-01-2026 08-01-2026 09-01-2026		TLM1,2	
13.	Atomic Clocks; Magnetometry	2	10-01-2026 15-01-2026		TLM1,2	
14.	State of the Art in Quantum; Sensing	3	16-01-2026 17-01-2026 22-01-2026		TLM1,2	
No. of classes required to complete UNIT-III: 6				**No. of classes taken:**		

UNIT-IV: Quantum Communications

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Basics of Digital Communication; Shannon Entropy; Basics of Quantum Communication	3	23-01-2026 24-01-2026 05-02-2026		TLM1,2	
16.	Quantum Security Eavesdropping & Countermeasures; Fibre-Based Quantum Communication	3	06-02-2026 07-02-2026 12-02-2026		TLM1,2	
17.	Free-Space Quantum Communication	3	13-02-2026 14-02-2026 19-02-2026		TLM1,2	
18.	Satellite-Based Quantum Communication	3	20-02-2026 21-02-2026 26-02-2026		TLM1,2	
19.	Achievements in Quantum Communication	3	27-02-2026 28-02-2026 05-03-2026		TLM1,2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Introduction to Quantum Materials

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Introduction to Quantum Materials; Importance of Quantum Materials; Applications – Quantum Computing, Spintronics	3	06-03-2026 07-03-2026 12-03-2026		TLM1,2	
21.	Topological Insulators; Superconductors	3	13-03-2026 14-03-2026 19-03-2026		TLM1,2	
22.	Mott Insulators; 2D Materials Quantum Spin Liquids	3	20-03-2026 21-03-2026		TLM1,2	
No. of classes required to complete UNIT-V: 7				**No. of classes taken:**		

Contents beyond the Syllabus

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.					**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. G. V. Suresh**	**Dr. G. V. Suresh**		**Dr. S. Nagarjuna Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified

Institution Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. **Dr.J. Nageswarao Rao**

Course Name & Code : SOFTWARE ENGINEERING & 23IT02

L-T-P Structure : **3-0-0** **Credits:** 3

Program/Sem/Sec : B.Tech/IV SEM /E **A.Y.:** 2025-26

Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3		2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering & Evolving role of Software	2	2/12/25 3/12/25		TLM1, 2	
2.	Software Development projects	1	7/12/25		TLM1, 2	
3.	Exploratory style of software developments	1	9/12/25		TLM1, 2	
4.	Emergence of software engineering	1	10/12/25		TLM1, 2	
5.	Notable changes in software development practices	1	11/12/25		TLM1, 2	
6.	Computer system engineering.	1	16/12/25		TLM1, 2	
7.	Software Life Cycle Models. Basic concepts	1	17/12/25		TLM1, 2	
8.	Waterfall model and its extensions.	1	18/12/25		TLM1, 2	
9.	Rapid application development	1	20/12/25		TLM1, 2	
10.	Agile development model.	1	23/12/25		TLM1, 2	
11.	Spiral Model.	1	24/12/25		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Software project management complexities	1	27/12/25		TLM1,2	
13.	Responsibilities of a software project manager	1	30/12/25		TLM1,2	
14.	Metrics for project size estimation Project estimation techniques	2	31/12/25 06/01/26		TLM1,2	
15.	Empirical Estimation techniques, COCOMO	1	07/01/26		TLM1,2	
16.	Halstead's software science, risk management.	2	08/01/26 20/01/26		TLM1,2	
17.	Requirements Analysis and Specification	1	21/01/26		TLM1,2	
18.	Software Requirements Specification (SRS)	1	22/01/26		TLM1,2	
19.	Axiomatic specification, Algebraic specification	1	24/01/26		TLM1,2	
20.	Executable specification and 4GL.	1	03/02/26		TLM1,2	
21.	Tutorial	1	04/02/26		TLM1,2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Software Design Overview of the design process	1	05/02/26		TLM1,2	
23.	How to characterize a good software design?	1	9/02/2026		TLM1,2	
24.	Layered arrangement of modules, Cohesion and Coupling	1	11/02/26		TLM1,2	
25.	Approaches to software design	1	12/02/26		TLM1,2	
26.	Agility and the Cost of Change, Agile Process	1	14/02/26		TLM1,2	
27.	Extreme Programming (XP), Other Agile Process Models	1	16/02/26		TLM1,2	
28.	Tool Set for the Agile Process	1	18/02/26		TLM1,2	
29.	Function-Oriented Software Design: Overview of SA/SD methodology	1	19/02/26		TLM1,2	
30.	Structured analysis, Developing the DFD model of a system	1	21/02/26		TLM1,2	
31.	Structured design, Detailed design, and Design Review	1	23/02/26		TLM1,2	
32.	User Interface Design: Characteristics of a good user interface	1	25/02/26		TLM1,2	
33.	Basic concepts, Types of user interfaces	1	26/02/26		TLM1,2	
34.	Fundamentals of component-based GUI development	1	28/02/26		TLM1,2	
35.	user interface design methodology.	1	03/03/26		TLM1,2	

36.	ASSIGNMENT-3					
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	Coding, Code review	1	04/03/26		TLM1,2	
38.	Software documentation, Testing.	1	05/03/26		TLM1,2	
39.	Black-box testing	1	07/03/26		TLM1,2	
40.	White-Box testing	1	10/03/26		TLM1,2	
41.	Debugging, Program analysis tools	1	11/03/26		TLM1,2	
42.	Integration testing	1	12/03/26		TLM1,2	
43.	Testing object-oriented programs	1	17/03/26		TLM1,2	
44.	Smoke testing, and some general issues associated with testing.	1	18/03/26		TLM1,2	
45.	Software Reliability and Quality Management: Software reliability	1	19/03/26		TLM1,2	
46.	Software quality management system	1	21/03/26		TLM1,2	
47.	ISO 9000.SEI Capability maturity model	1	24/03/26		TLM1,2	
48.	Few other important quality standards, and Six Sigma.	1	25/03/26		TLM1,2	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
49.	Computer-Aided Software Engineering (Case): CASE and its scope, CASE environment	1	26/03/26		TLM1,2	
50.	CASE support in the software life cycle and other characteristics of CASE tools	1	28/03/26		TLM1,2	
51.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	31/03/26		TLM1,2	
52.	Software Maintenance: Characteristics of software maintenance, Software reverse engineering	1	31/03/26		TLM1,2	

53.	Software maintenance process models and Estimation of maintenance cost.	1	01/04/26		TLM1,2	
54.	Software Reuse: reuse-definition, Introduction.	1	01/04/26		TLM1,2	
55.	Reason behind no reuse so far, Basic issues in any reuse program	1	02/04/26		TLM1,2	
56.	A reuse approach and Reuse at organization level.	1	04/04/26		TLM1,2	
57.	ASSIGNMENT-5				TLM3	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	28/03/26		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I,II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. J. Nageswara Rao**	**Dr. J. Nageswara Rao**	**Dr. Y.Vijay Bhaskhar Reddy**	**Dr. S.NagarjunaReddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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Accredited by NAAC with "A" Grade and NBA (CSE, IT, ECE, EEE & ME) under Tier - I
College Code: 76

MASTER OF BUSINESS ADMINISTRATION
COURSE HANDOUT

PART-A

Name of Course Instructor : **M r s J . D I V Y A**
Course Name & Code : **MEFA-23HS02**
L-T-P Structure : 2-0-0 Credits: 2
Program/Sem/Sec : CSE AIDS(F/Sec)., II-Sem. A. Y : 2025-26
Prerequisite: Basic Knowledge in business activities.

COURSE EDUCATIONAL OBJECTIVES(CEO):
- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate the capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3														
CO2	3	2													
CO3			2												
CO4				2		2									
CO5					2										
1 - Low				**2 –**Medium							**3 -** High				

Textbooks:
1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:
1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Business Economics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completeon	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Orientation	1	02/12/25		TLM1	CO1	T1,R2	
2.	Orientation	1	04/12/25		TLM1	CO1	T1,R2	
3.	Introduction to Economics	1	05/12/25		TLM1	CO1	T1,R2	
4.	Explaining about Managerial Economics	1	09/12/25		TLM1	CO1	T1,R2	
5.	Definitions of Economics- Nature and Scope of Economics	1	11/12/25		TLM1	CO1	T1,R2	
6	Demand-Law of demand	1	12/12/25		TLM1	CO1	T1,R2	
7	Elasticity of demand	1	16/12/25		TLM1	CO1	T1,R2	
8	Types of Elasticity of demand	1	18/12/25		TLM1	CO1	T1,R2	
9	Demand Forecasting - Methods of demand forecasting	1	19/12/25		TLM3	CO1	T1,R2	
No. of classes required to complete UNIT-I		09		No. of classes taken:				

UNIT-II: Theory of Production and Cost analysis

S.No.	Topics to be covered	No. of Classes Requi red	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Production Function	1	23/12/2025		TLM1	CO2	T1,R2	
2.	Isoquant and Isocost	1	26/12/2025		TLM1	CO2	T1,R2	
3.	Least Cost Combination of inputs	1	27/12/2025		TLM1	CO2	T1,R2	
4.	Law of Returns	1	30/01/2026		TLM1	CO2	T1,R2	
5.	Internal and External Economies of Scale	1	01/01/2026		TLM1	CO2	T1,R2	
6.	Cost Concepts	1	06/01/2026		TLM1	CO2	T1,R2	
7.	Break-even Analysis	1	08/01/2026		TLM1	CO2	T1,R2	
No. of classes required to complete UNIT-II		07		No. of classes taken:				

UNIT-III: Markets & Pricing Policies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Market structures	1	09/01/2026		TLM1	CO3		
2.	Markets-Types of markets	1	13/01/2026		TLM1	CO3		
3.	Features and price out determinations under Perfect competition	1	15/01/2026		TLM1	CO3		
4.	Features and price out determinations under Monopoly	1	16/01/2026		TLM1	CO3		
5.	Features and price out determinations under Monopolistic competition	1	17/01/2026		TLM1	CO3	T2,R4	
6.	Pricing –Pricing polices & its Objectives	1	20/01/2026		TLM1	CO3		
7.	Pricing Methods and its applications in business.	1	22/01/2026		TLM2	CO3		
8.	I MID EXAMS	1	23/01/2026		TLM1	CO3		
9.	I MID EXAMS	1	27/01/2026		TLM1	CO3		
10.	I MID EXAMS	1	29/01/2026		TLM1	CO3	T2,R4	
11.	I MID EXAMS	1	30/01/2026		TLM2	CO3	T2,R4	
No. of classes required to complete UNIT-III		11		No. of classes taken:				

UNIT-IV: Capital and Capital Budgeting

S. No.	Topics to be covered	No. of Classes Requi red	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcom e COs	Text Book followed	HOD Sign Weekly
1.	Nature and its significance	1	03/02/2026		TLM2	CO4	T2,R4	
2.	Types of Capital	1	05/02/2026		TLM2	CO4	T2,R4	
3.	Sources of raising capital	1	06/02/2026		TLM1	CO4	T2,R4	
4.	Capital budgeting Significance	1	10/02/2026		TLM1	CO4	T2,R4	
5.	Capital budgeting Process	1	12/02/2026		TLM1	CO4	T2,R4	
6.	Techniques of Capital Budgeting	1	13/02/2025		TLM1	CO4	T2,R4	
7	(non-discounted cash flow techniques and discounted cash flow of techniques).	1	17/02/2025		TLM1	CO4	T2,R4	
No. of classes required to complete UNIT-IV		07		No. of classes taken:				

UNIT-V: Financial Accounting and analysis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcom e COs	Text Book followed	HOD Sign Week ly
1.	Accounting significance	1	19/02/2026		TLM1	CO5	T2,R4	
2.	Book Keeping	2	20/02/2026 24/02/2026		TLM1	CO5	T2,R4	
3.	-Double entry system	2	26/02/2026 27/02/2026		TLM1	CO5	T2,R4	
5	Journal entries	2	03/03/2026 05/03/2026		TLM1	CO5	T2,R4	
6.	Journal entries	2	06/03/2026 10/03/2026		TLM1	CO5	T2,R4	
7	Journal	2	12/03/2026 13/03/2026		TLM1	CO5	T2,R4	
8	Ledger	2	17/03/2026 19/03/2026		TLM1	CO5	T2,R4	
9	Trial Balance	2	20/03/2026 24/03/2026		TLM1	CO5	T2,R4	
10	Final Accounts with simple adjustments	2	26/03/2026 27/03/2026		TLM1	CO5	T2,R4	
11	Financial Statement Analysis through ratios	2	02/03/2026 03/04/2026		TLM1	CO5	T2,R4	
08.	II Mid exams				TLM1	CO5	T2,R4	
09.	II Mid exams		-		TLM1	CO5	T2,R4	
1	II Mid exams		-		TLM1	CO5	T2,R4	

0								
1.	II Mid exams		06/04/2025					
No. of classes required to complete UNIT-V		11		No. of classes taken:				

Content beyond syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completeon	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Week ly
1.	Financial accounting	1	02/03/2026					
2.	Behavioral economics	1	03/03/2026					
		02						

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part – C- EVALUATION PROCESS:

Evaluation Task	Marks
Assignment-I (Units-I, II)	**A1=5**
I-Descriptive Examination (Units-I, II)	**M1=15**
I-Quiz Examination (Units-I, II)	**Q1=10**
Assignment-II (III, IV & V)	**A2=5**
II- Descriptive Examination (Unit-III, IV & V)	**M2=15**
II-Quiz Examination (Unit-III, IV & V)	**Q2=10**
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	**30**
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	**70**
Total Marks = CIE + SEE	**100**

PART-D: PROGRAMME OUTCOMES (POs) & PROGRAMME SPECIFIC OUTCOMES (PSOs):

Program Outcomes (POs):

PO 1:	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2:	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3:	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4:	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5:	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6:	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7:	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO 1:	**Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	**VLSI and Embedded Systems:** Design and Analyze Analog and Digital Electronic Circuits or systems and implement real time applications in the field of VLSI and Embedded Systems using relevant tools

PSO 3:	**Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Date:

Mrs. J DIVYA	DR.A .Adisesha Reddy	DR.A .Adisesha Reddy	
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE F
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. K. Jhansi Rani
COURSE COORDINATOR : Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	01/12/2025		TLM1	CO1	T1,T2	
2.	Syllabus Co's, PO's	1	02/12/2025		TLM1	CO1	T1,T2	
3.	Unit-1, Introduction to data science	1	03/12/2025		TLM1	CO1	T1,T2	
4.	Statistics- Population and sample, Collection of data,	1	04/12/2025		TLM1	CO1	T1,T2	
5.	Types of variables	1	08/12/2025		TLM1	CO1	T1,T2	
6.	Data visualization	1	09/12/2025		TLM1	CO1	T1,T2	
7.	Measures of central tendency, A.M	1	10/12/2025		TLM1	CO1	T1,T2	
8.	Median, mode problems	1	11/12/2025		TLM1	CO1	T1,T2	
9.	Measures of variability Range, Mean deviation	1	15/12/2025		TLM1	CO1	T1,T2	
10.	S.D. & Q D	1	16/12/2025		TLM1	CO1	T1,T2	
11.	Skewness	1	17/12/2025		TLM1	CO1	T1,T2	
12.	Kurtosis	1	18/12/2025		TLM1	CO1	T1,T2	
13.	TUTORIAL I	1	22/12/2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Types of Correlation	1	23/12/2025		TLM1	CO2	T1,T2	
15.	Coefficient of correlation	1	24/12/2025		TLM1	CO2	T1,T2	
16.	Rnak correlation	1	29/12/2025		TLM1	CO2	T1,T2	
17.	Linear regression (lines)	1	30/12/2025		TLM1	CO2	T1,T2	
18.	Problems	1	31/12/2025		TLM1	CO2	T1,T2	
19.	Multiple regression	1	05/01/2026		TLM1	CO2	T1,T2	
20.	Regression coefficients	1	06/01/2026		TLM1	CO2	T1,T2	
21.	Properties, problems	1	07/01/2026		TLM1	CO2	T1,T2	
22.	Fitting of parabola	1	08/01/2026		TLM1	CO2	T1,T2	
23.	Exponential curve	1	19/01/2026		TLM1	CO2	T1,T2	
24.	Fitting of power curve	1	20/01/2026		TLM1	CO2	T1,T2	
25.	TUTORIAL II	1	21/01/2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign

		Required	Completion	Completion	Methods	COs	followed	Weekly
26.	Probability, Introduction	1	22/01/2026		TLM1	CO3	T1,T2	
27.	Conditional probability	1	02/02/2026		TLM1	CO3	T1,T2	
28.	Bayes theorem	1	03/02/2026		TLM1	CO3	T1,T2	
29.	Problems	1	04/02/2026		TLM1	CO3	T1,T2	
30.	Random variables, Distribution function	1	05/02/2026		TLM1	CO3	T1,T2	
31.	Probability mass function	1	09/02/2026		TLM1	CO3	T1,T2	
32.	Probability density function	1	10/02/2026		TLM1	CO3	T1,T2	
33.	Mathematical expectation, variance	1	11/02/2026		TLM1	CO3	T1,T2	
34.	Binomial distribution	1	12/02/2026		TLM1	CO3	T1,T2	
35.	Poisson distribution	1	16/02/2026		TLM1	CO3	T1,T2	
36.	problems	1	17/02/2026		TLM1	CO3	T1,T2	
37.	Normal distribution	1	18/02/2026		TLM1	CO3	T1,T2	
38.	TUTORIAL III	1	19/02/2026		TLM3	CO3	T1,T2	
39.	Uniform distribution	1	23/02/2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		14			No. of classes taken:			

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
38.	Introduction: population & sample Sampling distribution	1	24/02/2026		TLM1	CO4	T1,T2	
39.	Sampling distribution of means & variance	1	25/02/2026		TLM1	CO4	T1,T2	
40.	problems	1	26/02/2026		TLM1	CO4	T1,T2	
41.	Central limit theorem	1	02/03/2026		TLM1	CO4	T1,T2	
42.	Estimation- point & interval, maximum error	1	03/03/2026		TLM1	CO4	T1,T2	
43.	Estimation using t-distribution	1	05/03/2026		TLM1	CO4	T1,T2	
44.	Estimation using F-distribution	1	09/03/2026		TLM1	CO4	T1,T2	
45.	Estimation using χ^2 −distribution	1	10/03/2026		TLM1	CO4	T1,T2	
46.	TUTORIAL IV	1	11/03/2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Multiple Integrals (Multi variable Calculus)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
47.	Hypothesis: introduction, Definitions	1	12/03/2026		TLM1	CO5	T1,T2	
48.	Z-test for single mean	1	16/03/2026		TLM1	CO5	T1,T2	

49.	Z-test for diff. of mean	1	17/03/2026		TLM1	CO5	T1,T2	
50.	Z-test for single proportion	1	18/03/2026		TLM1	CO5	T1,T2	
51.	Z-test for difference of proportion	1	23/03/2026		TLM1	CO5	T1,T2	
52.	t-test for single mean	1	24/03/2026		TLM1	CO5	T1,T2	
53.	t-test for diff. means,	1	25/03/2026		TLM1	CO5	T1,T2	
54.	F-test for variances	1	30/03/2026		TLM1	CO5	T1,T2	
55.	χ^2 −test for goodness of fit	1	31/03/2026		TLM1	CO5	T1,T2	
56.	χ^2 −test for independence	1	01/04/2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Paired t-test	1	02/04/2026		TLM1	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (16-12-2024 TO 21-12-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. K. Jhansi Rani	**Dr. D. Vijay Kumar**	**Dr. A. RAMI REDDY**	**Dr. T. SATYANARAYANA**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. O.VENKATA SIVA
Course Name & Code : Operating Systems -23CS06
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/F-sec **A.Y.:** 2025-26

PREREQUISITE: Computer organization

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

• Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection

• Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.

• Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low						**2** –Medium						**3** - High			

TEXTBOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018

2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS:

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018

2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems & System Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	01-12-2025		TLM2	
2.	operating system functions, operating systems operations	1	03-12-2025		TLM2	
3.	Computing environments, Free and Open-Source Operating Systems.	1	04-12-2025 06-12-2025		TLM2	
4.	Operating System Services, User and Operating-System Interface, system calls,	1	08-12-2025 10-12-2025		TLM2	
5.	Tutorial on Types of System Calls, system programs,	1	11-12-2025 13-12-2025		TLM2	
6.	operating system Design and Implementation	1	15-12-2025		TLM2	
7.	operating system structure,	1	17-12-2025		TLM2	
8.	Tutorial on Building and Booting an Operating System	1	18-12-2025		TLM2	
9.	Operating system debugging.	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Process Concept, Process scheduling	1	22-12-2025		TLM2	
11.	Operations on processes, Inter-process communication	1	24-12-2025		TLM2	
12.	Multithreading models	1	27-12-2025		TLM2	
13.	Thread libraries, Threading issues	1	29-12-2025		TLM2	
14.	CPU Scheduling Basic concepts, Scheduling criteria,	1	31-12-2025 05-01-2026		TLM2	
15.	Scheduling criteria,	1	07-01-2026		TLM2	
16.	Tutorial on Scheduling algorithms,	1	08-01-2026		TLM2	
17.	FCFS,SJF	1	10-01-2026		TLM2	
18.	Priority,round robin	1	19-01-2026 21-01-2026		TLM2	
19.	Tutorial on Multiple processor scheduling.	1	22-01-2026 24-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Synchronization Tools &Deadlocks

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

20.	The Critical Section Problem	1	02-02-2026		TLM1	
21.	Peterson's Solution, Mutex Locks,	1	04-02-2026		TLM1	
22.	Tutorial on Semaphores, Monitors,	1	05-02-2026		TLM1	
23.	Classic problems of Synchronization	1	09-02-2026		TLM1	
24.	system Model, Deadlock characterization,	1	11-02-2026		TLM1	
25.	Tutorial on Methods for handling Deadlocks,	1	12-02-2026		TLM1	
26.	Deadlock prevention	1	16-02-2026		TLM1	
27.	Deadlock avoidance	1	18-02-2026		TLM1	
28.	Tutorial on Deadlock detection,	1	19-02-2026		TLM1	
29.	Recovery from Deadlock.	1	21-02-2026		TLM1	
No. of classes required to complete UNIT-III: 10						

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction of Memory-Management Strategies	1	23-02-2026		TLM1	
31.	Contiguous memory allocation	1	25-02-2026		TLM1	
32.	Tutorial on Paging, Structure of the Page Table, Swapping.	1	26-02-2026		TLM1	
33.	Introduction of Virtual Memory Management	1	28-02-2026		TLM1	
34.	Demand paging, Copy-on-write	1	02-03-2026		TLM1	
35.	Page replacement	1	04-03-2026		TLM1	
36.	Tutorial on Allocation of frames, Thrashing	1	05-03-2026		TLM1	
37.	Introduction of Storage Management	1	07-03-2026		TLM1	
38.	Overview of Mass Storage Structure	1	09-03-2026		TLM1	
39.	HDD Scheduling	1	11-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Tutorial on File concept, Access methods, Directory Structure	1	12-03-2026		TLM2	
41.	File-system structure,	1	16-03-2026		TLM2	
42.	File-system Operations,	1	18-03-2026		TLM2	
43.	Directory implementation,	1	18-03-2026		TLM2	
44.	Allocation method, Free space management	1	21-03-2026		TLM2	
45.	File-System Mounting,	1	23-03-2026		TLM2	

46.	Partitions and Mounting	1	25-03-2026		TLM2	
47.	Tutorial on File Sharing.	1	26-03-2026		TLM2	
48.	Goals of protection,	1	28-03-2026		TLM2	
49.	Principles of protection	1	30-03-2026		TLM2	
50.	Protection Rings,	1	01-04-2026		TLM2	
51.	Domain of protection, Access matrix.	1	02-04-2026 04-04-2026		TLM2	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web application and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.O.V.SIVA**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)
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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: MR. D. Anil kumar
Course Name & Code : DATABASE MANAGEMENT SYSTEMS & 23CS03
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech IV Sem CSE – F Section **A.Y.:** 2025-26

PREREQUISITE: Data Structures

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Objective of this course is

- Introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra
- Introduce the concepts of basic SQL as a universal Database language
- Demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the foundation of database management system and various data models. (Understand-L2)
CO2	Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand-L2)
CO3	Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply-L3)
CO4	Apply various normalization techniques for efficient data handling. (Apply-L3)
CO5	Understand Transaction management, recovery & indexing techniques. (Understand-L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low					**2** –Medium						**3** – High				

TEXTBOOKS:

T1 Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)

T2 Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1 Introduction to Database Systems, 8thedition, C J Date, Pearson

R2 Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson

R3 Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DBMS Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, Introduction: An overview of Database Management System	1	02-12-2025		1 & 2	
2.	Characteristics (Database Vs File System), Database Users	1	03-12-2025		1 & 2	
3.	Advantages of Database Systems, Database Applications	1	05-12-2025		1 & 2	
4.	Data Models	1	06-12-2025		1 & 2	
5.	Concepts of Schema	1	09-12-2025		1 & 2	
6.	Instance and Data Independence	1	10-12-2025		1 & 2	
7.	Three tier schema architecture for data independence	1	12-12-2025		1 & 2	
8.	Database System Structure and	1	16-12-2025		1 & 2	
9.	Environment	1	17-12-2025		1 & 2	
10.	Centralized and Client Server architecture for the database	1	19-12-2025		1 & 2	
11.	Unit-1 Revision	1	20-12-2025		1 & 2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Entity Relationship Model and Relational Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Entity Relationship Model: Introduction	1	23-12-2025		1 & 2	
13.	Representation of entities, Attributes and entity set	1	24-12-2025		1 & 2	
14.	Relationship and relationship set	1	26-12-2025		1 & 2	
15.	Constraints	1	27-12-2025		1 & 2	
16.	Sub Classes and Super Class, Inheritance	1	30-12-2025		1 & 2	
17.	Specialization and Generalization using ER Diagrams	1	31-12-2025		1 & 2	
18.	Relational Model: Introduction to relational model	1	02-01-2026		1 & 2	
19.	Concepts of domain, Attribute and Tuple	1	03-01-2026		1 & 2	

20.	Relation and importance of null values	1	06-01-2026		1 & 2	
21.	Constraints (Domain, Key constraints, Integrity constraints) and their importance	1	07-01-2026		1 & 2	
22.	Relational Algebra	1	09-01-2026		1 & 2	
23.	Relational Calculus	1	20-01-2026		1 & 2	
24.	Unit-II revision	1	21-01-2026		1 & 2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: BASIC SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	BASIC SQL: Simple Database schema, data types	1	23-01-2026		1 & 2	
26.	Table definitions (create, alter), different DML operations (insert, delete, update)	1	24-01-2026		1 & 2	
27.	SQL querying (select and project) using where clause, arithmetic & logical operations	1	03-02-2026		1 & 2	
28.	SQL functions (Date and Time, Numeric, String conversion)	1	04-02-2026		1 & 2	
29.	Creating tables with relationship, implementation of key and integrity constraints	1	06-02-2026		1 & 2	
30.	Nested queries and sub queries	1	07-02-2026		1 & 2	
31.	Grouping and Aggregation	1	10-02-2026		1 & 2	
32.	Ordering	1	11-02-2026		1 & 2	
33.	Implementation of different types of joins	1	13-02-2026		1 & 2	
34.	View(updatable and non-updatable)	1	17-02-2026		1 & 2	
35.	Relational set operations	1	18-02-2026		1 & 2	
36.	Unit-III Revision	1	20-02-2026		1 & 2	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	Schema Refinement (Normalization): Purpose of Normalization or schema refinement	1	21-02-2026		1 & 2	
38.	Concept of functional dependency	1	24-02-2026		1 & 2	
39.	Normal forms based on functional dependency	1	25-02-2026		1 & 2	
40.	Lossless join and dependency preserving decomposition	1	27-02-2026		1 & 2	
41.	1NF and 2NF	1	28-02-2026		1 & 2	
42.	3 NF concept of surrogate key	1	03-03-2026		1 & 2	

43.	Concept of surrogate key	1	04-03-2026		1 & 2	
44.	BoyceCodd normal form (BCNF)	1	06-03-2026		1 & 2	
45.	MVD, Fourth normal form(4NF)	1	07-03-2026		1 & 2	
46.	Fifth Normal Form (5NF)	1	10-03-2026		1 & 2	
47.	Unit-IV revision	1	11-03-2026		1 & 2	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Transaction Processing and Concurrency Control, Introduction to Recovery Protocols and Introduction to Indexing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48.	Transaction Processing and Concurrency Control: Transaction State, ACID properties	1	13-03-2026		1 & 2	
49.	Concurrent Executions, Serializability, Recoverability	1	17-03-2026		1 & 2	
50.	Implementation of Isolation, Testing for Serializability	1	18-03-2026		1 & 2	
51.	Two-Phase Locking Techniques for concurrency control: Types of Locks, Time stamp-based locking	1	20-03-2026		1 & 2	
52.	Introduction to Recovery Protocols: Recovery Concepts, No-UNDO/REDO	1	21-03-2026		1 & 2	
53.	Recovery Based on Deferred Update, Recovery Techniques Based on Immediate Update	1	24-03-2026		1 & 2	
54.	Shadow Paging, ARIES	1	25-03-2026		1 & 2	
55.	Introduction to Indexing: Hash based Indexing, Unit-5 revision	1	27-03-2026		1 & 2	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Content Beyond Syllabus

S.NO	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes COs	Text Book Followed	HOD Sign
1.	NoSQL Databases	2	28-03-2026 31-03-2026					
No. of Classes		1			No. of classes taken:			
II MID EXAMINATIONS 06-04-2026 TO 11-04-2026								

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
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PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty				
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. B.LAVANYA

Course Name & Code : SOFTWARE ENGINEERING & 23IT02

L-T-P Structure : **3-0-0** **Credits:** 3

Program/Sem/Sec : B.Tech/IV SEM /F **A.Y.:** 2025-26

Regulations : R23

PREREQUISITE: Object Oriented Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them.
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3		2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering & Evolving role of Software	2	1/12/25 4/12/25		TLM1, 2	
2.	Software Development projects	1	5/12/25		TLM1, 2	
3.	Exploratory style of software developments	1	6/12/25		TLM1, 2	
4.	Emergence of software engineering	1	8/12/25		TLM1, 2	
5.	Notable changes in software development practices	1	11/12/25		TLM1, 2	
6.	Computer system engineering.	1	12/12/25		TLM1, 2	
7.	Software Life Cycle Models. Basic concepts	1	13/12/25		TLM1, 2	
8.	Waterfall model and its extensions.	1	15/12/25		TLM1, 2	
9.	Rapid application development	1	18/12/25		TLM1, 2	
10.	Agile development model.	1	19/12/25		TLM1, 2	
11.	Spiral Model.	1	20/12/25		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Software project management complexities	1	22/12/25		TLM1,2	
13.	Responsibilities of a software project manager	1	26/12/25		TLM1,2	
14.	Metrics for project size estimation Project estimation techniques	2	27/12/25 29/12/25		TLM1,2	
15.	Empirical Estimation techniques, COCOMO	1	02/01/26		TLM1,2	
16.	Halstead's software science, risk management.	2	05/01/26 08/01/26		TLM1,2	
17.	Requirements Analysis and Specification	1	09/01/26		TLM1,2	
18.	Software Requirements Specification (SRS)	1	19/01/26		TLM1,2	
19.	Axiomatic specification, Algebraic specification	1	22/01/26		TLM1,2	
20.	Executable specification and 4GL.	1	23/01/26		TLM1,2	
21.	Tutorial	1	24/01/26		TLM1,2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Software Design Overview of the design process	1	02/02/26		TLM1,2	
23.	How to characterize a good software design?	1	5/02/2026		TLM1,2	
24.	Layered arrangement of modules, Cohesion and Coupling	1	06/02/26		TLM1,2	
25.	Approaches to software design	1	09/02/26		TLM1,2	
26.	Agility and the Cost of Change, Agile Process	1	12/02/26		TLM1,2	
27.	Extreme Programming (XP), Other Agile Process Models	1	13/02/26		TLM1,2	
28.	Tool Set for the Agile Process	1	14/02/26		TLM1,2	
29.	Function-Oriented Software Design: Overview of SA/SD methodology	1	16/02/26		TLM1,2	
30.	Structured analysis, Developing the DFD model of a system	1	19/02/26		TLM1,2	
31.	Structured design, Detailed design, and Design Review	1	20/02/26		TLM1,2	
32.	User Interface Design: Characteristics of a good user interface	1	21/02/26		TLM1,2	
33.	Basic concepts, Types of user interfaces	1	23/02/26		TLM1,2	
34.	Fundamentals of component-based GUI development	1	26/02/26		TLM1,2	
35.	user interface design methodology.	1	27/02/26		TLM1,2	

36.	ASSIGNMENT-3					
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	Coding, Code review	1	28/02/26		TLM1,2	
38.	Software documentation, Testing.	1	02/03/26		TLM1,2	
39.	Black-box testing	1	05/03/26		TLM1,2	
40.	White-Box testing	1	06/03/26		TLM1,2	
41.	Debugging, Program analysis tools	1	07/03/26		TLM1,2	
42.	Integration testing	1	09/03/26		TLM1,2	
43.	Testing object-oriented programs	1	12/03/26		TLM1,2	
44.	Smoke testing, and some general issues associated with testing.	1	13/03/26		TLM1,2	
45.	Software Reliability and Quality Management: Software reliability	1	16/03/26		TLM1,2	
46.	Software quality management system	1	19/03/26		TLM1,2	
47.	ISO 9000.SEI Capability maturity model	1	23/03/26		TLM1,2	
48.	Few other important quality standards, and Six Sigma.	1	21/03/26		TLM1,2	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
49.	Computer-Aided Software Engineering (Case): CASE and its scope, CASE environment	1	23/03/26		TLM1,2	
50.	CASE support in the software life cycle and other characteristics of CASE tools	1	26/03/26		TLM1,2	
51.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	27/03/26		TLM1,2	
52.	Software Maintenance: Characteristics of software maintenance, Software reverse engineering	1	28/03/26		TLM1,2	

53.	Software maintenance process models and Estimation of maintenance cost.	1	30/03/26		TLM1,2	
54.	Software Reuse: reuse-definition, Introduction.	1	02/04/26		TLM1,2	
55.	Reason behind no reuse so far, Basic issues in any reuse program	1	03/04/26		TLM1,2	
56.	A reuse approach and Reuse at organization level.	1	04/04/26		TLM1,2	
57.	ASSIGNMENT-5				TLM3	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	28/03/26		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I,II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mrs. B.Lavanya**	**Dr. J. Nageswara Rao**	**Dr. Y.Vijay Bhaskhar Reddy**	**Dr. S.NagarjunaReddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., IV-Sem., CSE-F
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE : 2-0-0
COURSE CREDITS : 0
COURSE INSTRUCTOR : Dr. V. Bhagya Lakshmi
COURSE COORDINATOR : Dr. V. Bhagya Lakshmi
PRE-REQUISITES : Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	04-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	06-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	11-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	18-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources & Energy resources	1	20-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	27-12-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		06			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
7.	Ecosystems – Structure & Functions	1	03-01-2026		TLM1	CO2	T1,T2	
8.	Ecological succession &	1	08-01-2026		TLM1	CO2	T1,T2	
9.	Food chains, Food webs & Ecological Pyramids	1	17-01-2026		TLM1	CO2	T1,T2	
10.	Types of ecosystems	1	22-01-2026		TLM1	CO2	T1,T2	
11.	Biodiversity – introduction, levels, bio geographic classification	1	22-01-2026		TLM1	CO2	T1,T2	

12.	Values of Biodiversity, India as mega diversity nation. Threats to biodiversity and Conservation of biodiversity	1	24-01-2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		05			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Environmental pollution -Air pollution	1	05-02-2026		TLM1	CO3	T1,T2	
14.	Water pollution, Marine pollution, Thermal pollution	1	07-02-2026		TLM1	CO3	T1,T2	
15.	Soil pollution	1	12-02-2026		TLM1	CO3	T1,T2	
16.	Noise pollution & Nuclear Hazards	1	19-02-2026		TLM1	CO3	T1,T2	
17.	Solid waste management	1	21-02-2026		TLM1	CO3	T1,T2	
18.	Disaster management	1	26-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	From Unsustainable to Sustainable development	1	28-02-2026		TLM1	CO4	T1,T2	
20.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	28-02-2026		TLM1	CO4	T1,T2	
21.	Environmental ethics, Climate change. Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	05-03-2026		TLM1	CO4	T1,T2	
22.	Environmental Acts	1	07-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		04			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
23.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	12-03-2026		TLM1	CO5	T1,T2	
24.	Environment and human health –Human Rights – Value Education. HIV/AIDS	1	28-03-2026		TLM1	CO5	T1,T2	
25.	Women and Child Welfare	1	02-04-2026		TLM1	CO5	T1,T2	
26.	Role of information Technology in Environment and human health	1	04-04-2026		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		04			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Case studies	2	22-01-2026 02-04-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. V. Bhagya Lakshmi	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. O.VENKATA SIVA
Course Name & Code:-OPERATING SYSTEMS Lab&23CS55
L-T-P Structure :0-0-3 **Credits:1.5**
Program/Sem/Sec : II B.TECH-CSE/IV/F-sec **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course are to • Provide insights into system calls, file systems, semaphores,

• Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation

• Implement Bankers Algorithms to Avoid the Dead Lock

• acquire the generic software development skill through various stages of software life cycle

• generate test cases for software testing

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the threads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	3	-	-	-	-	-	-	-	3	3	-
CO2	1	1	1	2	2	-	-	-	-	-	-	-	3	3	2
CO3	2	1	1	2	1	-	-	-	-	-	-	-	3	3	3
CO4	-	-	-	-	-	-	-	2	2	3	-	-	-	-	-
1 - Low **2 –**Medium **3 -** High															

REFERENCE BOOKS:

R1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
R2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016
R3	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R4	

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	3	01-12-2025		**DM5**	
2.	Lab Cycle-2	3	08-12-2025		**DM5**	
3.	Lab Cycle -3	3	15-12-2025		**DM5**	
4.	Lab Cycle-4	3	22-12-2025		**DM5**	
5.	Lab Cycle-5	3	29-12-2025		**DM5**	
6.	Lab Cycle-6	3	05-01-2026		**DM5**	
7.	Lab Cycle-7	3	19-01-2026		**DM5**	
8.	Lab Cycle-8	3	02-02-2026		**DM5**	
9.	Lab Cycle-9	3	09-02-2026		**DM5**	
10.	Lab Cycle-10	3	16-02-2026		**DM5**	
11.	Lab Cycle-11	3	23-02-2026		**DM5**	
12.	Lab Cycle -12	3	02-03-2026		**DM5**	
13.	Lab Cycle-13	3	09-03-2026		**DM5**	
14.	Lab Cycle-13	6	16-03-2026 23-03-2026		**DM5**	
15.	Internal exam	3	13-03-2026			

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.O.V.SIVA**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr. D. Anil kumar
Course Name & Code : Database Management Systems Lab (23CS56)
L-T-P Structure :0-0-3 **Credits:**1.5
Program/Sem/Sec : B. Tech IV Sem CSE – F Section **A.Y.:** 2025-26

PRE-REQUISITE: Programming language, Discrete Mathematical Structures, and Data Structures.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This Course will enable students to
1. Populate and query a database using SQL DDL/DML Commands
2. Declare and enforce integrity constraints on a database
3. Writing Queries using advanced concepts of SQL
4. Programming PL/SQL including procedures, functions, cursors and triggers

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Implement SQL queries using DDL/DML commands.(**Apply-L3**)
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. (**Apply-L3**)
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. (**Apply-L3**)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical Values

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to SQL, syntax	3	02-12-2025		TLM4	
2	Sample Experiments	3	09-12-2025		TLM4	
3	Sample Experiments	3	16-12-2025		TLM4	
4	Sample Experiments	3	23-12-2025		TLM4	
5	Sample Experiments	3	30-12-2025		TLM4	
6	Sample Experiments	3	06-01-2026		TLM4	
7	Case study 1	3	03-02-2026		TLM4	
8	Case study 1	3	10-02-2026		TLM4	
9	Case study 1	3	17-02-2026		TLM4	
10	Case study 2	3	24-02-2026		TLM4	
11	Case study 2	3	03-03-2026		TLM4	
12	Case study 2	3	10-03-2026		TLM4	
13	Case study 3	3	17-03-2026		TLM4	
14	Case study 3	3	24-03-2026		TLM4	
15	Case study 3	3	31-03-2026		TLM4	
16	Internal Exam	3			TLM4	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	**Marks**
Day to Day Work	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Vice-voce	20
Semester End Examination(SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
PSO 2	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
PSO 3	To provide a concrete foundation and enrich their abilities for employment and Higher studies in Artificial Intelligence and Data Science with ethical values.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty				
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. NAGARJUNA REDDY

Course Name & Code : Full Stack Development-I & 23CSS2

L-T-P Structure : **0-1-2** **Credits:** 2

Program/Sem/Sec : B.Tech-CSE/IV/F **A.Y.:** 2025-26

PREREQUISITE: Knowledge of Basic Computer Hardware & Software.

COURSE EDUCATIONAL OBJECTIVE: The main objectives of the course are to

- Make use of HTML elements and their attributes for designing static web pages.
- Build a web page by applying appropriate CSS styles to HTML elements.
- Experiment with JavaScript to develop dynamic web pages and validate form.

COURSE OUTCOMES: After successful completion of the course the students are able to

CO1	Design static web pages by using HTML elements. (Apply-L3)
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. (Apply-L3)
CO3	Develop dynamic web pages and validate forms using JavaScript. (Apply-L3)
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Method	HOD Sign
1.	**Introduction to FSD-I**	3	05-12-2025		DM5	
2.	**Lab Cycle-1:** Lists, Links and Images	3	12-12-2025		DM5	
3.	**Lab Cycle-1:** Lists, Links and Images	3	19-12-2025		DM5	
4.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	26-12-2025		DM5	
5.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	02-01-2026		DM5	
6.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	09-01-2026		DM5	
7.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	23-01-2026		DM5	
8.	**Lab Cycle-4:** Selector forms	3	06-02-2026		DM5	
9.	**Lab Cycle-4:** Selector forms	3	13-02-202		DM5	
10.	**Lab Cycle-5:** CSS with Color, Background, Font, Text and CSS Box Model	3	20-02-2026		DM5	
11.	**Lab Cycle-6:** Applying JavaScript - internal and external, I/O, Type Conversion	3	27-02-2026		DM5	
12.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	06-03-2026		DM5	
13.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	13-03-2026		DM5	
14.	**Lab Cycle-8:** Java Script Conditional Statements and Loops.	3	20-03-2026		DM5	
15.	**Lab Cycle-9:** Java Script Functions and Events	3	27-03-2026		DM5	
16.	**Internal Exam**		03-04-2026			

Teaching Learning Method			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/ Field Work
DM3	Tutorial	**DM6**	Web Based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S. Nagarjuna Reddy	Dr. S. Nagarjuna Reddy	Dr. Y. Vijaya Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. D.Venkata Subbaiah & Mrs.P.M.Kamala Kumari
Regulation : R23
L-T-P Structure : 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – F Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze to work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low					**2** –Medium							**3** - High			

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Saturday (from 9.00 AM – 12.00 PM)

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–I Introduction to Design Thinking,** Introduction to elements and principles of Design,	3	03-12-2025		TLM2/ TLM4	
02	basics of design-dot, line, shape, form as fundamental design components, Principles of design	3	10-12-2025		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	17-12-2025		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	24-12-2025		TLM1	
05	Design thinking in social innovations. Tools of design thinking - person,	3	31-12-2025		TLM2	

	costumer					
06	journey map, brainstorming, product development (Activity)	3	07-12-2026		TLM4	
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	21-01-2026		TLM1/ TLM4	
I Mid Exams: 26-01-2025 to 31-01-2026						
08	Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.	3	04-02-2026		TLM2/ TLM4	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	11-02-2026		TLM4	
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	18-02-2026		TLM1/ TLM4	
11	Product planning, product specifications. Innovation towards product design Case studies.	3	25-02-2026		TLM2	
12	**Activity:** Importance of modeling, how to set specifications,Explaining their own product design	3	11-03-2026		TLM4	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	18-03-2026		TLM1/ TLM4	
14	Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition,	3	25-03-2026		TLM2/ TLM4	

	Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.					
15	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	01-04-2026		TLM1/ TLM4	
II Mid Exams: 06-04-2026 to 11-04-2026						
No. of classes required to complete: 45				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-B

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Signature				
Name of the Faculty	Dr. D. Venkata Subbaiah, Mrs.P.M.Kamala Kumari	Dr.V.Rama Krishna	Dr.K.Devi Priya	Dr. S.Nagarjuna Reddy
Designation	**Course Instructors**	**Course Coordinator**	**Module Coordinator**	**HoD**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.Swanth
Course Name & Code : Mathematical Foundations for Security -23CSH1
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/A-G-sec(Honors) **A.Y.:** 2025-26

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course is to make student

- To understand the mathematical fundamentals in probabilistic and statistical concepts
- To develop the understanding of the mathematical and logical basis of various modern techniques in information technology like machine learning, programming language design, and concurrency.
- To study various Graph Theory problems.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the basic notions of discrete and continuous probability (Understand-L2)
CO2	Apply the methods of statistical inference, and learn application of sampling distributions in Data mining and Machine Learning.(Apply-L3)
CO3	Apply statistical analysis to algorithmic problems of simple to moderate complexity in different domains (Apply-L3)
CO4	Model different applications of Computer science as graph theory problems (Apply-L3)
CO5	Evaluate modular exponentiation for cryptographic applications. (Evaluate-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low **2 –**Medium **3 -** High															

Text Books:

1. **John Vince, Foundation Mathematics for Computer Science, Springer, 2015.**
2. **K. Trivedi, Probability and Statistics with Reliability, Queuing, and Computer Science Applications, Wiley, 2001.**

Reference Books:

1. M. Mitzenmacher and E. Upfal, Probability and Computing: Randomized Algorithms and Probabilistic Analysis, 2005.

2. Alan Tucker, Applied Combinatorics, Wiley, 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Cyber Security	1	04-12-2025		TLM2	
2.	Density, and cumulative distribution functions	1	05-12-2025		TLM2	
3.	Expected value, conditional expectation	1	06-12-2025		TLM2	
4.	Problems	1	11-12-2025		TLM2	
5.	Applications of the univariate and multivariate Central Limit Theorem	1	12-12-2025		TLM2	
6.	Probabilistic inequalities	1	13-12-2025		TLM2	
7.	Probabilistic inequalities problems	1	18-12-2025		TLM2	
8.	Probabilistic inequalities, Markov chains	1	19-12-2025		TLM2	
9.	Markov chains	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 9				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Random samples	1	26-12-2025		TLM2	
11.	Problems on Random samples	1	27-12-2025		TLM2	
12.	sampling distributions of estimators	1	2-1-2026		TLM2	
13.	Problems on sampling distributions of estimators	1	3-1-2026		TLM2	
14.	Maximum Likelihood	1	08-01-2026		TLM2	
15.	Problems on Maximum Likelihood	1	09-01-2026 10-01-2026		TLM2	
16.	Revision	1	10-01-2026		TLM2	
17.	Unit Test-2	1	24-01-2026		TLM2	
No. of classes required to complete UNIT-II: 8				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Statistical inference	1	05-02-2026		TLM1	
19.	Introduction to multivariate statistical models	1	06-02-2026		TLM1	
20.	classification problems	1	07-02-2026		TLM1	
21.	principal component analysis	1	12-02-2026		TLM1	
22.	The problem of over fitting model assessment	1	13-02-2026		TLM1	
23.	Problems on to multivariate statistical models	1	14-02-2026		TLM1	
24.	Problems on principal component analysis	1	19-02-2026		TLM1	
25.	Unit Test-3	1	20-02-2026		TLM1	
No. of classes required to complete UNIT-III: 8						

UNIT-IV

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Isomorphism	1	21-02-2026		TLM1	
27.	Planar graphs, graph coloring	1	26-02-2026		TLM1	
28.	Hamilton circuits and Euler cycles	1	27-02-2026		TLM1	
29.	Permutations and Combinations with and without repetition	1	28-02-2026		TLM1	
30.	Specialized techniques to solve combinatorial enumeration problems	1	05-03-2026		TLM1	
31.	Problems on Isomorphism	1	06-03-2026		TLM1	
32.	Unit Test-4	1	07-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 7				**No. of classes taken:**		

UNIT-V

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Elementary number theory	1	12-03-2026		TLM2	
34.	Unique factorization	1	13-03-2026		TLM2	
35.	Euler's function	1	14-03-2026		TLM2	
36.	Modular arithmetic	1	20-03-2026		TLM2	
37.	Fermat's little theorem,	1	21-03-2026		TLM2	
38.	Chinese remainder theorem	1	26-03-2026		TLM2	
39.	modular exponentiation	1	28-03-2026		TLM2	
40.	Tutorial on File Sharing.	1	26-03-2026		TLM2	
41.	Unit Test-5	1	28-03-2026		TLM2	
No. of classes required to complete UNIT-V: 9				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr B.Swanth**	**Dr.B.Swanth**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs.G.V.Rajya Lakshmi
Course Name & Code : DATABASE MANAGEMENT SYSTEMS & 23CS03
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech IV Sem CSE – G Section **A.Y.:** 2025-26
PREREQUISITE : Data Structures

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to introduce database management systems and to give a good formal foundation on the relational model of data and usage of Relational Algebra. Introduce the concepts of basic SQL as a universal Database language and to demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization. Provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the foundation of database management system and various data models. (Understand- L2)
CO2	Identify relational model concepts, implement various constraints, perform SQL queries and DML operations. (Understand- L2)
CO3	Apply SQL queries, functions, and work with nested queries, grouping, joins, views, and set operations. (Apply - L3)
CO4	Apply various normalization techniques for efficient data handling. (Apply-L3)
CO5	Understand Transaction management, recovery & indexing techniques. (Understand-L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
CO5	3	2	2	-	-	-	-	-	-	-	-	2	3	2	3
1 - Low			**2** –Medium						**3** – High						

TEXTBOOKS:

T1 Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)..

T2 Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

R1 Introduction to Database Systems, 8thedition, C J Date, Pearson.

R2 Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson

R3 Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DBMS Introduction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, Introduction: An overview of Database Management System	1	03-12-2025		1 & 2	
2.	Database System Vs File System, Database System Concepts	1	04-12-2025		1 & 2	
3.	Database Users, Advantages of Database systems.	1	05-12-2025		1 & 2	
4.	Database applications	1	06-12-2025		1 & 2	
5.	Database Models	1	10-12-2025		1 & 2	
6.	Database Schema and Instances, Data Independence	1	11-12-2025		1 & 2	
7.	Three Tier Schema Architecture for data independence	1	12-12-2025		1 & 2	
8.	Database System Structure	1	13-12-2025		1 & 2	
9.	Database environment, components	1	17-12-2025		1 & 2	
10.	Centralized and Client Server architecture for the database.	1	18-12-2025		1 & 2	
11.	Examples on Real time databases	1	19-12-2025		1 & 2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Entity – Relationship model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Introduction to ER-Model	1	20-12-2025		1 & 2	
13.	Representation of entities, attributes	1	24-12-2025		1 & 2	
14.	entity set, relationship, relationship set,	1	26-12-2025		1 & 2	
15.	constraints, sub classes, super class, inheritance,	1	27-12-2025		1 & 2	
16.	specialization, generalization using ER Diagrams.	1	31-12-2025		1 & 2	
17.	Case scenarios on ER diagrams	1	01-01-2026		1 & 2	
18.	Introduction to relational model, concepts of domain,	1	02-01-2026		1 & 2	
19.	Attribute, tuple, relation, Examples	2	07-01-2026		1 & 2	
20.	importance of null values, examples	1	08-01-2026		1 & 2	
21.	constraints (Domain, Key constraints, integrity constraints) and their	2	21-01-2026		1 & 2	

	importance,					
22.	Relational Algebra	1	22-01-2026		1 & 2	
23.	Relational Calculus	2	24-01-2026		1 & 2	
No. of classes required to complete UNIT-II: 15				**No. of classes taken:**		
I MID EXAMINATIONS (27-01-2026 TO 31-01-2026)						

UNIT-III: Introduction to SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Basic SQL, Simple Database schema, data types	1	04-02-2026		1 & 2	
25.	Table definitions- create, alter commands in SQL	1	05-02-2026		1 & 2	
26.	Different DML operations (insert, delete, update).	1	06-02-2026		1 & 2	
27.	SQL querying (select and project) using where clause, arithmetic & logical operations,	1	07-02-2026		1 & 2	
28.	SQL functions (Date and Time, Numeric, String conversion).	1	11-02-2026		1 & 2	
29.	Creating tables with relationship, implementation of key and integrity constraints,	1	12-02-2026		1 & 2	
30.	nested queries, sub queries.	1	13-02-2026		1 & 2	
31.	grouping, aggregation, ordering commands	1	14-02-2026		1 & 2	
32.	implementation of different types of joins	1	18-02-2026		1 & 2	
33.	view(updatable and non-updatable), relational set operations.	1	19-02-2026			
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Schema Refinement (Normalization)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Purpose of Normalization or schema refinement	1	20-02-2026		1 & 2	
35.	Concept of functional dependency	1	21-02-2026		1 & 2	
36.	FD closure and Attribute closure	1	25-02-2026		1 & 2	
37.	First Normal form, Second Normal Form	2	27-02-2026		1 & 2	
38.	Third Normal Form – Transitive dependency	2	04-03-2026		1 & 2	
39.	Boyce-Codd normal form (BCNF) – properties	1	05-03-2026		1 & 2	
40.	Examples on 1NF,2NF,3NF & BCNF	1	07-03-2026		1 & 2	
41.	Lossless join and dependency preserving decomposition,	1	11-03-2026		1 & 2	
42.	MVD, Fourth normal form(4NF),	1	12-03-2026		1 & 2	
43.	Fifth Normal Form (5NF).	1	13-03-2026		1 & 2	

44.	Examples on finding normal forms on given tables.	1	14-03-2026		1 & 2	
45.	Tutorial on all normal forms.	1	18-03-2026			
No. of classes required to complete UNIT-IV: 14				**No. of classes taken:**		

UNIT-V: Transaction Processing, Concurrency Control & Introduction to Indexing

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to Transaction, Transaction State diagram, ACID properties	1	20-03-2026		1 & 2	
47.	Concurrent Executions, Serializability	1	25-03-2026		1 & 2	
48.	Recoverability, Implementation of Isolation	1	26-03-2026		1 & 2	
49.	view & conflict serializability, Two-Phase Locking Techniques for concurrency control	1	28-03-2026		1 & 2	
50.	Types of Locks, Time stamp-based locking. Recovery Concepts	1	01-04-2026		1 & 2	
51.	No-UNDO/REDO Recovery Based on Deferred Update, ARIES – algorithm	1	02-04-2026		1 & 2	
52.	Recovery Techniques Based on Immediate Update, Shadow Paging,	1	03-04-2026		1 & 2	
53.	Hash based Indexing	1	04-04-2026		1 & 2	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	NoSQL databases	1	01-04-25		TLM5	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS 06-04-2025 TO 11-04-2025)								

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mrs.G.V.Rajya Lakshmi**	**Dr.M.Srinivasa Rao**	**Dr.Y.Vijaya Bahskar Reddy**	**Dr. S. Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : G.V.Rajya Lakshmi
Course Name & Code : DataBase Management Systems Lab (23CS56)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-G A.Y : 2025-26

PRE-REQUISITE : Programming language, Discrete Mathematical Structures and Data Structures.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This Course will enable students to populate and query a database using SQL DDL/DML Commands. Declare and enforce integrity constraints on a database and writing Queries using advanced concepts of SQL. To program PL/SQL including procedures, functions, cursors and triggers.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Implement SQL queries using DDL/DML commands.**(Apply-L3)**
CO 2	Apply different Integrity constraints & Normalization techniques for effective database design. **.(Apply-L3)**
CO 3	Implement PL/SQL including procedures, functions, cursors and triggers. **.(Apply-L3)**
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	3	3
CO2	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO3	3	2	2	-	-	-	-	-	-	-	-	2	1	1	3
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-G

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to DBMS – SQL, CO-PO-PSO mapping	3	02-12-2025			
2	Create, alter, insert rows and Dropping of table	3	09-12-2025		TLM4	
3	Select queries with various constraints	3	16-12-2025		TLM4	
4	sub queries with operations	3	23-12-2025		TLM4	
5	Queries using Aggregate functions	3	30-12-2025		TLM4	
6	Queries using Conversion functions -date-time, Strings	3	06-01-2026		TLM4	
7	Simple PL/SQL program	3	20-01-2026		TLM4	
8	Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.	3	03-02-2026		TLM4	
9	Programs include NESTED IF, CASE	3	10-02-2026		TLM4	
10	Programs using WHILE & FOR loops	3	17-02-2026		TLM4	
11	creation of procedures – IN & OUT parameters	3	24-02-2026		TLM4	
12	Stored functions in PL/SQL	3	10-03-2026		TLM4	
13	Programs using CURSORS, Triggers	3	17-03-2026		TLM4	
14	Search operations using Index and Non-Index, Design database for Case study	3	24-03-2026		TLM4	
15	Internal Exam	3	31-03-2026		TLM4	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**G.V.Rajya Lakshmi**	**Dr.M.Srinivasa Rao**	**Dr.Y.Vijaya Bahskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. CH. Srinivasa Rao
Regulation : R23
L-T-P Structure : 1-0-2 **Credits:** 02
Program/Sem/Sec : B.Tech – IV Semester – G Section **A.Y.:** 2025-26

PREREQUISITE: None

COURSE OBJECTIVES:

The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply fundamental design components, principles, and new materials to create and improve design projects. (Applying-L3)
CO2	Apply the design thinking process to develop and present innovative product solutions. (Applying-L3)
CO3	Analyze the relationship between creativity and innovation, evaluate their roles in organizations, and develop strategic plans for transforming creative ideas into innovative solutions. (Analyzing-L4)
CO4	Analyze work in a multidisciplinary environment. (Analyzing-L4)
CO5	Apply design thinking principles to address business challenges, develop and test business models and prototypes, and evaluate the value of creativity. (Evaluating-L5)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			3							2		3	
CO2	1	2	2		3							2		3	
CO3	3	3		2	3							3			3
CO4	1	1			3							2			3
1 - Low **2 –**Medium **3 -** High															

Textbooks:
1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Schedule of Experiments: Friday (from 9.00 AM – 12.00 PM)

S. No	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	**UNIT–I Introduction to Design Thinking,** Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components	3	05-12-25		TLM2/ TLM4	
02	Principles of design	3	12-12-25		TLM1	
03	Introduction to design thinking, history of Design Thinking, New materials in Industry	3	19-12-25		TLM1/ TLM2	
04	**UNIT – II Design Thinking Process** Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions	3	26-12-25		TLM1	
05	Design thinking in social innovations. Tools of design thinking - person, costumer	3	02-01-26		TLM2	
06	journey map, brainstorming, product development (Activity)	3	09-01-26		TLM4	
07	**UNIT – III Innovation** Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations	3	23-01-26			
08	Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.	3	06-02-26		TLM2/ TLM4	
09	**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation	3	13-02-26		TLM4	
10	**UNIT – IV Product Design** Problem formation, introduction to product design, Product strategies, Product value	3	20-02-26		TLM1/ TLM4	
11	Product planning, product	3			TLM2	

	specifications. Innovation towards product design Case studies.		27-02-26			
12	**Activity:** Importance of modeling, how to set specifications, Explaining their own product design	3	06-03-26		TLM4	
13	**UNIT – V Design Thinking in Business Processes** Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	3	13-03-26		TLM1/ TLM4	
14	**Activity:** How to market our own product, about maintenance, Reliability and plan for startup.	3	27-03-06		TLM4	
II Mid Exams: 05-12-2025 to 12-03-2026						
No. of classes required to complete : 42				**No. of classes taken:**		

PART-C

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern Engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**Engineer and society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receiving clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.Ch.Srinivasa Rao**	**Dr.D.Venkata Subbaiah**	**Dr.D.Venkata Subbaiah**	**Dr.S. Nagarjuna Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** II B. Tech., IV-Sem., CSE-G
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**: Environmental Science**
L-T-P STRUCTURE	**:** 2-0-0
COURSE CREDITS	**:** 0
COURSE INSTRUCTOR	**:** Dr. V. Bhagya Lakshmi
COURSE COORDINATOR	**:** Dr. V. Bhagya Lakshmi
PRE-REQUISITES	**:** Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.

T2. Palaniswamy,EnvironmentalStudies,2/e,Pearsoneducation,2014.

T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	01-12-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	03-12-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	08-12-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	10-12-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	15-12-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	17-12-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	22-12-2025					
No. of classes required to complete UNIT-I		06			No. of classes taken:			

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8.	Ecosystems – Structure & Functions	1	24-12-2025		TLM1	CO2	T1,T2	
9.	Ecological succession &	1	29-12-2025		TLM1	CO2	T1,T2	
10.	Food chains, Food webs & Ecological Pyramids	1	31-12-2025		TLM1	CO2	T1,T2	
11.	Types of ecosystems	1	05-01-2026		TLM1	CO2	T1,T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	07-01-2026		TLM1	CO2	T1,T2	
13.	Values of Biodiversity, India as mega diversity nation	1	19-01-2026		TLM1	CO2	T1,T2	

14.	Threats to biodiversity and Conservation of biodiversity	1	21-01-2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Environmental pollution -Air pollution	1	02-02-2026		TLM1	CO3	T1,T2	
16.	Water pollution, Marine pollution, Thermal pollution	1	04-02-2026		TLM1	CO3	T1,T2	
17.	Soil pollution	1	09-02-2026		TLM1	CO3	T1,T2	
18.	Noise pollution & Nuclear Hazards	1	11-02-2026		TLM1	CO3	T1,T2	
19.	Solid waste management	1	16-02-2026		TLM1	CO3	T1,T2	
20.	Disaster management	1	18-02-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
21.	From Unsustainable to Sustainable development	1	23-02-2026		TLM1	CO4	T1,T2	
22.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	24-02-2026		TLM1	CO4	T1,T2	
23.	Environmental ethics, Climate change	1	02-03-2026		TLM1	CO4	T1,T2	
24.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	09-03-2026		TLM1	CO4	T1,T2	
25.	Environmental Acts	1	11-03-2026		TLM1	CO4	T1,T2	
26.	Environmental Acts	1	16-03-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	18-03-2026		TLM1	CO5	T1,T2	
28.	Environment and human health –Human Rights – Value Education	1	23-03-2026		TLM1	CO5	T1,T2	
29.	HIV/AIDS – Women and Child Welfare	1	25-03-2026		TLM1	CO5	T1,T2	
30.	Role of information Technology in Environment and human health	1	30-03-2026		TLM1	CO5	T1,T2	
31.	Revision	1	01-04-2026		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		06			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Case studies	2	23-01-2026 20-03-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (06-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. V. Bhagya Lakshmi	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. GOVINDU

Course Name & Code : Full Stack Development-I & 23CSS2

L-T-P Structure : **0-1-2** **Credits:** 2

Program/Sem/Sec : B.Tech-CSE/IV/G **A.Y.:** 2025-26

PREREQUISITE: Knowledge of Basic Computer Hardware & Software.

COURSE EDUCATIONAL OBJECTIVE: The main objectives of the course are to

- Make use of HTML elements and their attributes for designing static web pages.
- Build a web page by applying appropriate CSS styles to HTML elements.
- Experiment with JavaScript to develop dynamic web pages and validate form.

COURSE OUTCOMES: After successful completion of the course the students are able to

CO1	Design static web pages by using HTML elements. (Apply-L3)
CO2	Develop a web page by applying appropriate CSS styles to HTML elements. (Apply-L3)
CO3	Develop dynamic web pages and validate forms using JavaScript. (Apply-L3)
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, A Press, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Method	HOD Sign
1.	**Introduction to FSD-I**	3	01-12-2025		DM5	
2.	**Lab Cycle-1:** Lists, Links and Images	3	08-12-2025		DM5	
3.	**Lab Cycle-1:** Lists, Links and Images	3	15-12-2025		DM5	
4.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	22-12-2025		DM5	
5.	**Lab Cycle-2:** HTML Tabes, Forms and Frames	3	29-12-2025		DM5	
6.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	05-01-2026		DM5	
7.	**Lab Cycle-3:** HTML-5,Cascading Style Sheets and Types of CSS	3	19-01-2026		DM5	
8.	**Lab Cycle-4:** Selector forms	3	02-02-2026		DM5	
9.	**Lab Cycle-4:** Selector forms	3	09-02-2026		DM5	
10.	**Lab Cycle-5:** CSS with Color, Background, Font, Text and CSS Box Model	3	16-02-2026		DM5	
11.	**Lab Cycle-6:** Applying JavaScript - internal and external, I/O, Type Conversion	3	23-02-2026		DM5	
12.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	02-03-2026		DM5	
13.	**Lab Cycle-7:** Java Script Pre-defined and User-defined Objects	3	09-03-2026		DM5	
14.	**Lab Cycle-8:** Java Script Conditional Statements and Loops.	3	16-03-2026		DM5	
15.	**Lab Cycle-9:** Java Script Functions and Events	3	23-03-2026		DM5	
16.	**Internal Exam**		30-03-2026			

Teaching Learning Method			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/ Field Work
DM3	Tutorial	**DM6**	Web Based Learning

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S.Govindu	Dr. S. Nagarjuna Reddy	Dr. Y. Vijaya Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				

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College Code: 76

MASTER OF BUSINESS ADMINISTRATION
COURSE HANDOUT

PART-A

Name of Course Instructor : **M r s J . D I V Y A**
Course Name & Code : **MEFA-23HS02**
L-T-P Structure : 2-0-0 Credits: 2
Program/Sem/Sec : CSE AIDS(G/Sec)., II-Sem. A. Y : 2025-26
Prerequisite: Basic Knowledge in business activities.

COURSE EDUCATIONAL OBJECTIVES(CEO):
- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview of investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Define the concepts related to Managerial Economics, Financial Accounting and Management. **(Understand-L2)**
CO2	Understand the fundament also Economics viz., Demand, Production, cost, revenue and markets. **(Understand-L2)**
CO3	Apply the Concept of Production cost and revenues for effective Business decision **(Apply-L3)**
CO4	Evaluate the capital budgeting techniques **(Analyze-L4)**
CO5	Develop accounting statements and evaluate the financial performance of business entity. **(Analyze-L4)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3														
CO2	3	2													
CO3			2												
CO4				2		2									
CO5					2										
1 - Low				**2 –**Medium							**3 -** High				

Textbooks:
1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:
1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi. 4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Business Economics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completeon	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Orientation	1	01/12/25		TLM1	CO1	T1,R2	
2.	Orientation	1	02/12/25		TLM1	CO1	T1,R2	
3.	Introduction to Economics	1	05/12/25		TLM1	CO1	T1,R2	
4.	Explaining about Managerial Economics	1	08/12/25		TLM1	CO1	T1,R2	
5.	Definitions of Economics- Nature and Scope of Economics	1	09/12/25		TLM1	CO1	T1,R2	
6	Demand-Law of demand	1	12/12/25		TLM1	CO1	T1,R2	
7	Elasticity of demand	1	15/12/25		TLM1	CO1	T1,R2	
8	Types of Elasticity of demand	1	16/12/25		TLM1	CO1	T1,R2	
9	Demand Forecasting - Methods of demand forecasting	1	19/12/25		TLM3	CO1	T1,R2	
No. of classes required to complete UNIT-I		09		No. of classes taken:				

UNIT-II: Theory of Production and Cost analysis

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Production Function	1	22/12/2025		TLM1	CO2	T1,R2	
2.	Isoquant and Isocost	1	23/12/2025		TLM1	CO2	T1,R2	
3.	Least Cost Combination of inputs	1	26/12/2025		TLM1	CO2	T1,R2	
4.	Law of Returns	1	02/01/2026		TLM1	CO2	T1,R2	
5.	Internal and External Economies of Scale	1	05/01/2026		TLM1	CO2	T1,R2	
6.	Cost Concepts	1	06/01/2026		TLM1	CO2	T1,R2	
7.	Break-even Analysis	1	09/01/2026		TLM1	CO2	T1,R2	
No. of classes required to complete UNIT-II		07		No. of classes taken:				

UNIT-III: Markets & Pricing Policies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Market structures	1	12/01/2026		TLM1	CO3		
2.	Markets-Types of markets	1	13/01/2026		TLM1	CO3		
3.	Features and price out determinations under Perfect competition	1	16/01/2026		TLM1	CO3		
4.	Features and price out determinations under Monopoly	1	19/01/2026		TLM1	CO3		
5.	Features and price out determinations under Monopolistic competition	1	20/01/2026		TLM1	CO3	T2,R4	
6.	Pricing –Pricing polices & its Objectives	1	20/01/2026		TLM1	CO3		
7.	Pricing Methods and its applications in business.	1	23/01/2026		TLM2	CO3		
8.	I MID EXAMS	1	23/01/2026		TLM1	CO3		
9.	I MID EXAMS	1	26/01/2026		TLM1	CO3		
10.	I MID EXAMS	1	27/01/2026		TLM1	CO3	T2,R4	
11.	I MID EXAMS	1	30/01/2026		TLM2	CO3	T2,R4	
No. of classes required to complete UNIT-III		11		No. of classes taken:				

UNIT-IV: Capital and Capital Budgeting

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Nature and its significance	1	02/02/2026		TLM2	CO4	T2,R4	
2.	Types of Capital	1	03/02/2026		TLM2	CO4	T2,R4	
3.	Sources of raising capital	1	06/02/2026		TLM1	CO4	T2,R4	
4.	Capital budgeting Significance	1	09/02/2026		TLM1	CO4	T2,R4	
5.	Capital budgeting Process	1	10/02/2026		TLM1	CO4	T2,R4	
6.	Techniques of Capital Budgeting	1	13/02/2025		TLM1	CO4	T2,R4	
7	(non-discounted cash flow techniques and discounted cash flow of techniques).	1	16/02/2025		TLM1	CO4	T2,R4	
No. of classes required to complete UNIT-IV		07		No. of classes taken:				

UNIT-V: Financial Accounting and analysis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Week ly
1.	Accounting significance	1	17/02/2026		TLM1	CO5	T2,R4	
2.	Book Keeping	2	20/02/2026 23/02/2026		TLM1	CO5	T2,R4	
3.	-Double entry system	2	24/02/2026 02/03/2026		TLM1	CO5	T2,R4	
5	Journal entries	2	03/03/2026 06/03/2026		TLM1	CO5	T2,R4	
6.	Journal entries	2	09/03/2026 10/03/2026		TLM1	CO5	T2,R4	
7	Journal	2	13/03/2026 16/03/2026		TLM1	CO5	T2,R4	
8	Ledger	2	17/03/2026 20/03/2026		TLM1	CO5	T2,R4	
9	Trial Balance	2	23/03/2026 24/03/2026		TLM1	CO5	T2,R4	
10	Final Accounts with simple adjustments	2	27/03/2026 30/03/2026		TLM1	CO5	T2,R4	
11	Financial Statement Analysis through ratios	2	31/03/2026 03/04/2026		TLM1	CO5	T2,R4	
08.	II Mid exams				TLM1	CO5	T2,R4	
09.	II Mid exams		-		TLM1	CO5	T2,R4	
1	II Mid exams		-		TLM1	CO5	T2,R4	

0								
1.	II Mid exams		06/04/2025					
No. of classes required to complete UNIT-V		11		No. of classes taken:				

Content beyond syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completeon	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Week ly
1.	Financial accounting	1	02/03/2026					
2.	Behavioral economics	1	03/03/2026					
		02						

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part – C- EVALUATION PROCESS:

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	**A1=5**
I-Descriptive Examination (Units-I, II)	**M1=15**
I-Quiz Examination (Units-I, II)	**Q1=10**
Assignment-II (III, IV & V)	**A2=5**
II- Descriptive Examination (Unit-III, IV & V)	**M2=15**
II-Quiz Examination (Unit-III, IV & V)	**Q2=10**
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	**30**
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	**70**
Total Marks = CIE + SEE	**100**

PART-D: PROGRAMME OUTCOMES (POs) & PROGRAMME SPECIFIC OUTCOMES (PSOs):

Program Outcomes (POs):

PO 1:	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2:	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3:	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4:	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5:	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6:	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7:	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO 1:	**Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	**VLSI and Embedded Systems:** Design and Analyze Analog and Digital Electronic Circuits or systems and implement real time applications in the field of VLSI and Embedded Systems using relevant tools

PSO 3:	**Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Date:

Mrs. J DIVYA	DR.A .Adisesha Reddy	DR.A .Adisesha Reddy	
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. CH VENKATA NARAYANA
Course Name & Code:-OPERATING SYSTEMS Lab&23CS55
L-T-P Structure :0-0-3 **Credits:1.5**
Program/Sem/Sec : II B.TECH-CSE/IV/G-sec **A.Y.:**2025-26

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course are to

• Provide insights into system calls, file systems, and semaphores.

• Develop and debug CPU Scheduling algorithms, page replacement algorithms, thread implementation.

• Implement Bankers Algorithm to Avoid the Deadlock.

• Acquire the generic software development skill through various stages of software life cycle.

• Generate test cases for software testing.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Implement and evaluate fundamental operating system concepts through programming exercises, including UNIX commands, system calls, and simulations of CPU scheduling algorithms. (L3)
CO2	Analyze synchronization mechanisms (semaphores and monitors) and memory allocation algorithms (first-fit, worst-fit, best-fit) through writing concurrent programs using the threads library. (L4)
CO3	Apply operating system concepts of memory management, deadlock avoidance, and file allocation strategies through simulations and experimentation with a real operating system (Nachos). (L3)
CO4	Improve individual/ Teamwork skills, communication and report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	3	-	-	-	-	-	-	-	3	3	-
CO2	1	1	1	2	2	-	-	-	-	-	-	-	3	3	2
CO3	2	1	1	2	1	-	-	-	-	-	-	-	3	3	3
CO4	-	-	-	-	-	-	-	2	2	3	-	-	-	-	-

1 - Low	**2 –**Medium	**3 -** High

REFERENCE BOOKS:

R1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
R2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson, 2016.
R3	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018.
R4	

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Unix Commands	6	05-12-2025 12-12-2025		**DM5**	
2.	Lab Cycle-2	3	19-12-2025		**DM5**	
3.	Lab Cycle -3	3	26-12-2025		**DM5**	
4.	Lab Cycle-4	3	02-1-2026		**DM5**	
5.	Lab Cycle-5	3	9-1-2026		**DM5**	
6.	Lab Cycle-6	3	16-01-2026		**DM5**	
7.	Lab Cycle-7	3	23-01-2026		**DM5**	
8.	Lab Cycle-8	3	06-02-2026		**DM5**	
9.	Lab Cycle-9	3	13-02-2026		**DM5**	
10.	Lab Cycle-10	3	20-02-2026		**DM5**	
11.	Lab Cycle-11	3	27-02-2026		**DM5**	
12.	Lab Cycle-13	3	06-03-2026		**DM5**	
13.	Lab Cycle-13	3	13-03-2026		**DM5**	
14.	practice	3	03-04-2026		**DM5**	
15.	Internal exam	3	27-03-2026			

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society: Apply** reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.CVN Reddy**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. CH VENKATA NARAYANA
Course Name & Code : Operating Systems -23CS06
L-T-P Structure :3-0-0 **Credits:** 3
Program/Sem/Sec : II B.tech-CSE/IV-sem/G-sec **A.Y.:** 2025-26

PREREQUISITE: Computer organization

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objectives of the course are to make student

• Understand the basic concepts and principles of operating systems, including process management, memory management, file systems, and Protection.

• Make use of process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.

• Illustrate different conditions for deadlock and their possible solutions.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the fundamental concepts, functions, and structures of operating systems, including their design, implementation, and the various types of system calls and services. (Understand-L2)
CO2	Understand process concepts, multithreading models, and CPU scheduling algorithms to effectively manage operations on processes, inter-process communication, and threading issues in operating systems. (Understand-L2)
CO3	Analyze synchronization tools, deadlock handling methods to solve critical section problems and ensure efficient process synchronization in operating systems. (Apply-L3)
CO4	Analyze different memory management techniques paging and segmentation to understand their suitability for various memory allocation scenarios. (Apply-L3)
CO5	Apply knowledge of file system structures and protection mechanisms to design and implement secure file management systems. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	2	3							3	2	2	2
CO2	2	2	1										2	3	2
CO3	1	2	1										2	3	2
CO4	2	1	1		3								2	2	
CO5	2	2	2											3	3
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018

2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS:

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018

2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Operating Systems & System Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Operating systems	1	02-12-2025		TLM2	
2.	operating system functions, operating systems operations	1	04-12-2025		TLM2	
3.	Computing environments, Free and Open-Source Operating Systems.	1	05-12-2025 06-12-2025		TLM2	
4.	Operating System Services, User and Operating-System Interface, system calls,	1	09-12-2025 11-12-2025		TLM2	
5.	Types of System Calls, system programs,	1	12-12-2025 13-12-2025		TLM6	
6.	operating system Design and Implementation	1	16-12-2025		TLM2	
7.	operating system structure,	1	18-12-2025		TLM2	
8.	Building and Booting an Operating System	1	19-12-2025		TLM2	
9.	Operating system debugging.	1	20-12-2025		TLM2	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Process Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Process Concept, Process scheduling	1	23-12-2025		TLM6	
11.	Operations on processes, Inter-process communication	1	26-12-2025		TLM2	
12.	Multithreading models	1	27-12-2025		TLM2	
13.	Thread libraries, Threading issues	1	30-12-2025		TLM6	
14.	CPU Scheduling Basic concepts, Scheduling criteria,	1	2-01-2026 03-01-2026		TLM2	
15.	Scheduling criteria,	1	06-01-2026		TLM2	
16.	Scheduling algorithms,	1	8-01-2026		TLM2	
17.	FCFS,SJF	1	9-01-2026		TLM2	
18.	Priority,round robin	1	10-01-2026 20-01-2026		TLM2	
19.	Multiple processor scheduling.	1	22-01-2026 23-01-2026		TLM2	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Synchronization Tools &Deadlocks

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

20.	The Critical Section Problem	1	24-01-2026		TLM1	
21.	Peterson's Solution, Mutex Locks,	1	03-02-2026		TLM6	
22.	Semaphores, Monitors,	1	05-02-2026		TLM1	
23.	Classic problems of Synchronization	1	06-02-2026		TLM1	
24.	system Model, Deadlock characterization,	1	07-02-2026		TLM1	
25.	Methods for handling Deadlocks,	1	10-02-2026		TLM6	
26.	Deadlock prevention	1	12-02-2026		TLM1	
27.	Deadlock avoidance	1	13-02-2026		TLM1	
28.	Deadlock detection,	1	14-02-2026		TLM1	
29.	Recovery from Deadlock.	1	17-02-2026		TLM6	
No. of classes required to complete UNIT-III: 10						

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction of Memory-Management Strategies	1	19-02-2026		TLM1	
31.	Contiguous memory allocation	1	20-02-2026		TLM1	
32.	Paging, Structure of the Page Table, Swapping.	1	21-02-2026		TLM1	
33.	Introduction of Virtual Memory Management	1	24-02-2026		TLM6	
34.	Demand paging, Copy-on-write	1	26-02-2026		TLM1	
35.	Page replacement	1	27-02-2026		TLM1	
36.	Allocation of frames, Thrashing	1	28-02-2026		TLM1	
37.	Introduction of Storage Management	1	05-03-2026		TLM1	
38.	Overview of Mass Storage Structure	1	06-03-2026		TLM1	
39.	HDD Scheduling	1	07-03-2026		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	File concept, Access methods, Directory Structure	1	1 10-03-2026		TLM6	
41.	File-system structure,	1	12-03-2026		TLM2	
42.	File-system Operations,	1	13-03-2026		TLM2	
43.	Directory implementation,	1	14-03-2026		TLM2	
44.	Allocation method, Free space management	1	17-03-2026		TLM2	
45.	File-System Mounting,	1	24-03-2026		TLM2	
46.	Partitions and Mounting	1	27-03-2026		TLM2	
47.	File Sharing.	1	28-03-2026		TLM2	

48.	Goals of protection,	1	31-03-2026		TLM6	
49.	Principles of protection	1	02-04-2026		TLM2	
50.	Protection Rings,	1	03-04-2026		TLM2	
51.	Domain of protection, Access matrix.	1	04-04-2026		TLM2	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R19 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web application and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr.CVN Reddy**	**Dr.CVN Reddy**	**Dr.Venkata Subaiah**	**Dr.S.Nagarjuna Reddy**
Signature				

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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : II B. Tech., II-Sem., CSE-G
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : PROBABILITY & STATISTICS
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Mrs. Sk.Haseena Begum
COURSE COORDINATOR : Dr. D. Vijay Kumar
PRE-REQUISITES : Basics of mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): Upon successful completion of this course, the student should be able to

CO1: Classify the concepts of data science and its importance (L2)
CO2: Interpret the association of characteristics and through correlation and regression tools (L3)
CO3: Apply discrete and continuous probability distributions (L3)
CO4: Design the components of a classical hypothesis test (L4)
CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	-	-	-	-	-	-	-	2
CO2	3	3	2	3	-	-	-	-	-	-	-	2
CO3	3	3	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	3	-	-	-	-	-	-	-	2
CO5	3	3	2	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED 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.

BOS APPROVED REFERENCE ROOKS:

1. **Shron L. Myers, Keying Ye, Ronald E Walpole,** Probability and Statistics for Engineers and the Scientists, 8th Edition. Pearson 2007.
2. **Jay 1. 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.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: Descriptive statistics and methods for data science

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction class	1	01/12/2025		TLM1	CO1	T1, T2	
2.	Syllabus Co's, PO's	1	03/12/2025		TLM1	CO1	T1, T2	
3.	Unit-1, Introduction to data science	1	04/12/2025		TLM1	CO1	T1, T2	
4.	Statistics- Population and sample, Collection of data,	1	05/12/2025		TLM1	CO1	T1, T2	
5.	Types of variables	1	08/12/2025		TLM1	CO1	T1, T2	
6.	Data visualization	1	10/12/2025		TLM1	CO1	T1, T2	
7.	Measures of central tendency, A.M	1	11/12/2025		TLM1	CO1	T1, T2	
8.	Median, mode problems	1	12/12/2025		TLM1	CO1	T1, T2	
9.	Measures of variability Range, Mean deviation	1	15/12/2025		TLM1	CO1	T1, T2	
10.	S.D. & Q D	1	17/12/2025		TLM1	CO1	T1, T2	
11.	Skewness	1	18/12/2025		TLM1	CO1	T1, T2	
12.	Kurtosis	1	19/12/2025		TLM1	CO1	T1, T2	
13.	Tutorial	1	22/12/2025		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Correlation and Regression

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Correlation, types	1	24/12/2025		TLM1	CO2	T1, T2	
15.	Coefficient of correlation	1	26/12/2025		TLM1	CO2	T1, T2	
16.	Rnak correlation	1	29/12/2025		TLM1	CO2	T1, T2	
17.	Linear regression (lines)	1	31/12/2025		TLM1	CO2	T1, T2	
18.	Problems	1	02/01/2026		TLM1	CO2	T1, T2	
19.	Multiple regression	1	05/01/2026		TLM1	CO2	T1, T2	
20.	Regression coefficients	1	07/01/2026		TLM1	CO2	T1, T2	
21.	Properties, problems	1	08/01/2026		TLM1	CO2	T1, T2	
22.	Fitting of parabola	1	09/01/2026		TLM1	CO2	T1, T2	
23.	Exponential curve	1	17/01/2026		TLM1	CO2	T1, T2	
24.	Fitting of power curve	1	19/01/2026		TLM1	CO2	T1, T2	
25.	Tutorial II	1	21/01/2026		TLM3	CO2	T1, T2	
26.	Problems	1	22/01/2026		TLM1	CO2	T1, T2	
27.	Revision	1	23/01/2026		TLM1	CO2	T1, T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

I MID EXAMINATIONS (26-01-2026 TO 31-01-2026)

UNIT-III: Probability and Distributions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Probability, Introduction	1	02/02/2026		TLM1	CO3	T1, T2	
29.	Conditional probability	1	04/02/2026		TLM1	CO3	T1, T2	
30.	Bayes theorem	1	05/02/2026		TLM3	CO3	T1, T2	
31.	Problems	1	06/02/2026		TLM1	CO3	T1, T2	
32.	Random variables, Distribution function	1	09/02/2026		TLM1	CO3	T1, T2	
33.	Probability mass function	1	11/02/2026		TLM1	CO3	T1, T2	
34.	Probability density function	1	12/02/2026		TLM1	CO3	T1, T2	
35.	Mathematical expectation, variance	1	13/02/2026		TLM3	CO3	T1, T2	
36.	Binomial distribution	1	16/02/2026		TLM1	CO3	T1, T2	
37.	Poisson distribution	1	18/02/2026		TLM1	CO3	T1, T2	
38.	Normal distribution	1	19/02/2026		TLM1	CO3	T1, T2	
39.	Uniform distribution	1	20/02/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Sampling Theory

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction: population & sample Sampling distribution	1	23/02/2026		TLM1	CO4	T1, T2	
41.	Sampling distribution of means & variance	1	25/02/2026		TLM1	CO4	T1, T2	
42.	problems	1	26/02/2026		TLM1	CO4	T1, T2	
43.	Central limit theorem	1	27/03/2026		TLM3	CO4	T1, T2	
44.	Estimation- point & interval, maximum error	1	02/03/2026		TLM1	CO4	T1, T2	
45.	Estimation using t-distribution	1	05/03/2026		TLM1	CO4	T1, T2	
46.	problems	1	06/03/2026		TLM3	CO4	T1, T2	
47.	Estimation using F-distribution	1	09/03/2026		TLM1	CO4	T1, T2	
48.	Estimation using χ^2 −distribution	1	11/03/2026		TLM1	CO4	T1, T2	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

UNIT-V: Tests of Hypothesis

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Hypothesis: introduction, Definitions	1	12/03/2026		TLM1	CO5	T1, T2	

50.	Z-test for single mean	1	13/03/2026		TLM1	CO5	T1, T2	
51.	Z-test for diff. of mean	1	16/03/2026		TLM3	CO5	T1, T2	
52.	Z-test for single proportion	1	18/03/2026		TLM1	CO5	T1, T2	
53.	Z-test for difference of proportion	1	20/03/2026		TLM1	CO5	T1, T2	
54.	t-test for single mean	1	23/03/2026		TLM1	CO5	T1, T2	
55.	t-test for diff. means,	1	25/03/2026		TLM1	CO5	T1, T2	
56.	F-test for variances	1	27/03/2026		TLM1	CO5	T1, T2	
57.	χ^2 −test for goodness of fit	1	30/03/2026		TLM1	CO5	T1, T2	
58.	χ^2 −test for independence	1	01/04/2026		TLM1	CO5	T1, T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
59.	Paired t-test	1	2/04/2026		TLM1	CO5	T1, T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (6-04-2026 TO 11-04-2026)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Sk.Haseena Begum	**Dr. D. Vijay Kumar**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in,
Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.G.V.Suresh
Course Name & Code **:**23QT01 – Survey of Quantum Technologies and Applications
L-T-P Structure **: 3-0-0** **Credits:**3
Program/Sem/Sec : B.Tech/IV SEM **A.Y.:**2025-26
Regulations : R23

PREREQUISITE:Quantum Physics, DLD, Network Security

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course is meant to give an overview of the field of quantum technologies and make the students familiar with state-of-the-art in all four verticals. The emphasis is not on depth in this course, but on covering the exciting aspects of the field. The general physical principles of realizing qubits for computation

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Summarize the foundational concepts of quantum physicsquantum states, wavefunctions, superposition, tunneling, and entanglementand outline their relevance to quantum technologies. (**L2–Understand**)
CO2	Apply the principles of qubits and basic quantum gates to construct simple quantum circuits and identify key quantum algorithms and physical qubit platforms.**(L3–Apply)**
CO3	Apply the principles of quantum sensing to interpret the functioning of devices such as atomic clocks, gravimeters, and quantum magnetometers.**(L3–Apply)**
CO4	Summarize the key ideas of quantum communication and differentiate fiber-based, free-space, and satellite quantum links with respect to security and performance.**(L2–Understand)**
CO5	Classify major quantum materialsincluding topological insulators, superconductors, Mott insulators, and 2D materialsand outline their applications in quantum technologies.**(L2–Understand)**

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	2	2	1	1	1	1	2	1	3	2	1	1
CO2	3	3	2	2	3	1	1	1	1	2	1	3	3	2	1
CO3	3	3	2	3	3	1	1	1	1	2	1	3	2	1	1
CO4	3	3	1	2	3	2	1	2	1	3	1	3	2	2	1
CO5	3	3	2	2	2	1	2	1	1	2	1	3	2	2	2
1 - Low			**2 –**Medium								**3 -** High				

TEXTBOOKS:

T1	Quantum Information Science – Manenti R., Motta M., 1st Edition, Oxford University Press (2023)
T2	Quantum computation and quantum information – Nielsen M. A., and Chuang I. L., 10th Anniversary edition, Cambridge University Press (2010)

REFERENCE BOOKS:

R1	Elements of Quantum Computation and Quantum Communication, A. Pathak, Boca Raton, CRC Press (2015)
R2	An Introduction to Quantum Computing, Phillip Kaye, Raymond Laflamme, and Michele Mosca, Oxford University Press (2006)
R3	Quantum computing explained, David McMahon, Wiley (2008)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Quantum Technologies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
UNIT-I						
1.	Introduction to Quantum Technologies – Four Verticals;Motivation for Quantum Technologies;	1	04-12-2025		TLM1, 2	
2.	Quantum States; Wavefunctions;	1	05-12-2025		TLM1, 2	
3.	Probabilistic Interpretation; Physical Observables;	1	06-12-2025		TLM1, 2	
4.	Hermitian Operators; Expectation Values;Heisenberg Uncertainty Principle; Schrödinger Equation;	1	11-12-2025		TLM1, 2	
5.	Time Evolution; Distinction from Classical Physics; Superposition; Tunnelling; Entanglement	1	12-12-2025		TLM1, 2	
6.	No-Cloning Theorem; Simulating Classical Systems; Feynman's Quantum Simulator Idea	1	13-12-2025		TLM1, 2	
No. of classes required to complete UNIT-I: 6				**No. of classes taken:**		

UNIT-II: Quantum Computation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	Basics of Qubits – What is a Qubit?; Difference Between Classical Bits and Qubits	1	18-12-2025		TLM1,2	
8.	Review of Classical Logic Gates;Basics of Qubit Gates; Quantum Circuits; Physicalimplementation of Qubits;Semiconducting Qubits – Quantum Dots	1	19-12-2025		TLM1,2	
9.	Spin Qubits;Superconducting Qubits – Charge/Flux/Phase;Topological Qubits;Trapped Ions Rydberg Atoms; Neutral Atoms	2	20-12-2025 25-12-2025		TLM1,2	
10.	Photon Qubits – Linear Optical Setups; Integrated Photonics; NMR Qubits; NV Centres	2	26-12-2025 27-12-2025		TLM1,2	
11.	RSA Algorithm; Shor's Algorithm; Quantum Advantage; Long-Term Strategies; Error Correction	2	01-01-2026 02-01-2026		TLM1,2	
No. of classes required to complete UNIT-II:8				**No. of classes taken:**		

UNIT-III: Quantum Sensing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Basics of Quantum Sensing. Single Photon Generation. Entangled Photon Generation. Photon Detection; Gravimetry	3	03-01-2026 08-01-2026 09-01-2026		TLM1,2	
13.	Atomic Clocks; Magnetometry	2	10-01-2026 15-01-2026		TLM1,2	
14.	State of the Art in Quantum; Sensing	3	16-01-2026 17-01-2026 22-01-2026		TLM1,2	
No. of classes required to complete UNIT-III: 6				**No. of classes taken:**		

UNIT-IV: Quantum Communications

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Basics of DigitalCommunication; Shannon Entropy; Basics of Quantum Communication	3	23-01-2026 24-01-2026 05-02-2026		TLM1,2	
16.	Quantum SecurityEavesdropping & Countermeasures; Fibre-Based Quantum Communication	3	06-02-2026 07-02-2026 12-02-2026		TLM1,2	
17.	Free-Space Quantum Communication	3	13-02-2026 14-02-2026 19-02-2026		TLM1,2	
18.	Satellite-Based Quantum Communication	3	20-02-2026 21-02-2026 26-02-2026		TLM1,2	
19.	Achievements in Quantum Communication	3	27-02-2026 28-02-2026 05-03-2026		TLM1,2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Introduction to Quantum Materials

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Introduction to Quantum Materials; Importance of Quantum Materials; Applications – Quantum Computing, Spintronics	3	06-03-2026 07-03-2026 12-03-2026		TLM1,2	
21.	Topological Insulators; Superconductors	3	13-03-2026 14-03-2026 19-03-2026		TLM1,2	
22.	Mott Insulators; 2D Materials Quantum Spin Liquids	3	20-03-2026 21-03-2026		TLM1,2	
No. of classes required to complete UNIT-V: 7				**No. of classes taken:**		

Contents beyond the Syllabus

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.					**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- DescriptiveExamination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1),(M2+Q2+A2))+20% of Min((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineeringand management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	TheabilitytoapplySoftwareEngineeringpracticesandstrategiesinsoftwareproject developmentusingopen-sourceprogrammingenvironmentforthesuccessoforganization.
PSO2	Theability to design anddevelop computerprogramsinnetworking, webapplications andIoT asperthesocietyneeds.
PSO3	Toinculcateanabilitytoanalyze,designandimplementdatabaseapplications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. G. V. Suresh**	**Dr. G. V. Suresh**		**Dr. S. Nagarjuna Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.J.Nageswara Rao
Course Name & Code : SOFTWARE ENGINEERING & 23IT02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV SEM /G **A.Y.:** 2025-26
Regulations : R23

PREREQUISITE: Object Oriented Programming
COURSE EDUCATIONAL OBJECTIVES (CEOs):

- NNNJJJJJJJJJJJJJ
- Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces.
- To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understanding the Evolution in Software Development and Implementation of Modern Software Development Practices **(Understand - L2)**
CO2	Understand Software Project Management and Requirements Analysis Techniques. **(Understand - L2)**
CO3	Demonstrate Effective Software Design and Agile Practices. **(Apply - L3)**
CO4	Apply Coding, Testing, and Quality Management Practices.**(Apply - L3)**
CO5	Apply the usage of CASE tools, Software Maintenance process and Software Reuse. **(Apply - L3)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2								3	2	3	3	
CO2	2	2	2								3	2	3	3	
CO3	-	2	3								3	2	3	2	
CO4	2	2									3	2	3	3	
CO5	3	2									3	2	3	3	
1 - Low			**2** –Medium								**3** - High				

TEXTBOOKS:

T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition

REFERENCE BOOKS:

R1	Software Engineering, Ian Sommerville, 10thEdition, Pearson
R2	Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
R3	https://nptel.ac.in/courses/106/105/106105182/
R4	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview
R5	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction & Software Life Cycle Models

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Software Engineering	1	2/12/2025		TLM1, 2	
2.	Evolving role of Software	1	3/12/2025		TLM1, 2	
3.	Software Development projects	1	6/12/2025		TLM1, 2	
4.	Exploratory style of software developments .	1	6/12/2025		TLM1, 2	
5.	Emergence of software engineering	1	9/12/2025		TLM1, 2	
6.	Notable changes in software development practices,	1	10/12/2025		TLM1, 2	
7.	Computer system engineering. Software Life Cycle Models.	1	13/12/2025		TLM1, 2	
8.	Software Life Cycle Models. Basic concepts	1	13/12/2025		TLM1, 2	
9.	Waterfall model and its extensions.	1	16/12/2025		TLM1, 2	
10.	Rapid application development Agile development model.	1	17/12/2025		TLM1, 2	
11.	Agile development model	1	20/12/2025		TLM1, 2	
12.	Spiral Model.	1	20/12/2025		TLM1, 2	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Software Project Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Software project management complexities	2	23/12/2025 27/12/2025		TLM1,2	

14.	Responsibilities of a software project manager	1	27/12/2025		TLM1,2	
15.	Metrics for project size estimation Project estimation techniques	2	30/12/2025 31/01/2026		TLM1,2	
16.	Empirical Estimation techniques, COCOMO	1	3/01/2026		TLM1,2	
17.	Halstead's software science, risk management.	1	3/01/2026		TLM1,2	
18.	Requirements Analysis and Specification	2	6/01/2026 7/01/2026		TLM1,2	
19.	Software Requirements Specification (SRS)	2	10/01/2026 10/01/2026		TLM1,2	
20.	Axiomatic specification, Algebraic specification	2	20/01/2026 21/01/2026		TLM1,2	
21.	Executable specification and 4GL.	1	24/01/2026		TLM1,2	
22.	Tutorial	1	24/01/2026		TLM1,2	
No. of classes required to complete UNIT-II: 15				**No. of classes taken:**		

UNIT-III: Software Design:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Software Design Overview of the design process	1	3/02/2026		TLM1,2	
24.	How to characterize a good software design?	1	4/02/2026		TLM1,2	
25.	Layered arrangement of modules, Cohesion and Coupling	1	7/02/2026		TLM1,2	
26.	Approaches to software design	1	7/02/2026		TLM1,2	
27.	Agility and the Cost of Change, Agile Process	1	10/02/2026		TLM1,2	
28.	Extreme Programming (XP), Other Agile Process Models	1	11/02/2026		TLM1,2	
29.	Tool Set for the Agile Process	1	14/02/2026		TLM1,2	
30.	Function-Oriented Software Design: Overview of SA/SD methodology	1	14/02/2026		TLM1,2	
31.	Structured analysis, Developing the DFD model of a system	1	17/02/2026		TLM1,2	
32.	Structured design, Detailed design, and Design Review	1	18/02/2026		TLM1,2	
33.	User Interface Design: Characteristics of a good user interface	1	21/02/2026		TLM1,2	
34.	Basic concepts, Types of user interfaces	1	21/02/2026		TLM1,2	
35.	Fundamentals of component-based GUI development	1	24/02/2026		TLM1,2	
36.	user interface design methodology.	1	25/02/2026		TLM1,2	
37.	Tutorial	1	28/02/2026		TLM1,2	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

UNIT-IV: Coding and Testing:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Coding, Code review	1	28/02/2026		TLM1,2	
39.	Software documentation, Testing,	1	3/03/2026		TLM1,2	
40.	Black-box testing	1	4/03/2026		TLM1,2	
41.	White-Box testing	1	7/03/2026		TLM1,2	
42.	Debugging, Program analysis tools, Integration testing	1	7/03/2026		TLM1,2	
43.	Testing object-oriented programs, Smoke testing, and some general issues associated with testing.	1	10/03/2026		TLM1,2	
44.	Software Reliability and Quality Management: Software reliability	1	11/03/2026		TLM1,2	
45.	Software quality management system, ISO 9000.SEI Capability maturity model	1	14/03/2026		TLM1,2	
46.	Few other important quality standards, and Six Sigma.	1	14/03/2026		TLM1,2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Computer-Aided Software Engineering(CASE)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction Computer-Aided Software Engineering (CASE), CASE and its scopes	1	17/03/2026		TLM1,2	
48.	CASE environment	1	18/03/2026		TLM1,2	
49.	CASE support in the software life cycle. CASE support in the software life cycle	1	21/03/2026		TLM1,2	
50.	CASE support in the software life cycle, other characteristics of CASE tools	1	24/04/2026		TLM1,2	
51.	Towards second generation CASE Tool, Architecture of a CASE Environment.	1	25/03/2026		TLM1,2	
52.	Software Maintenance: Characteristics of software maintenance, . Software reverse engineering	1	28/03/2026		TLM1,2	
53.	. Software maintenance process models and	1	28/03/2026		TLM1,2	

	Estimation of maintenance cost					
54.	Software Reuse: reuse-definition, Introduction, Reason behind no reuse so far	1	31/03/2026		TLM1,2	
55.	Basic issues in any reuse program	1	1/04/2026		TLM1,2	
56.	A reuse approach and Reuse at organization level.	1	4/04/2026		TLM1,2	
57.	ASSIGNMENT-5	1	4/04/2026		TLM3	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Emerging Technologies in Software Engineering	1	26/03/25		**TLM6**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max (M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. J. Nageswara Rao**	**Dr. J. Nageswara Rao**	**Dr. Y. Vijaya Bhaskar Reddy**	**Dr.S.Nagarjuna Reddy**
Signature				