



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.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. M. Sitha Ram
Course Name & Code : DAA (20CS06)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CSE., IV-A A.Y: 2023-24

PRE-REQUISITE: Data structures and DMS

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to learn various algorithm design techniques and analyze the computing resources of the algorithms and motivate the students to design new algorithms for various problems.

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

CO 1	Identify the characteristic of an algorithm and analyses its time and space complexity. (UnderstandL2)
CO 2	Apply the divide-and-conquer method for solving problems like searching and sorting. (Apply - L3)
CO 3	Design Greedy algorithms for the optimization problems like knapsack problem, minimum cost spanning tree, single source shortest path problem. (Apply - L3)
CO 4	Apply dynamic programming paradigm to solve optimization problems like travelling salesperson problem, 0/1 knapsack problem, Optimal binary search tree (Apply- L3)
CO 5	Analyze the backtracking and branch and bound search methods on optimization problems like N-queen, sum of subsets, 0/1 knapsack, Hamiltonian circuit and so on. (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	3	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	2
CO3	2	2	-	1	-	-	-	-	-	-	-	-	-	-	3
CO4	2	3	-	1	-	-	-	-	-	-	-	-	-	-	1
CO5	2	3	1	-	-	-	-	-	-	-	-	-	-	-	1

Note: Enter Correlation Levels 1 or 2 or 3. If there is no correlation, put '-'

1- Slight (Low), 2 - Moderate (Medium), 3 - Substantial (High).

TEXT BOOKS:

T1: Ellis Horowitz, Sartaj Sahni, 'Fundamentals of Computer Algorithms', Galgotia Publications.

T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson ,

2007.

REFERENCE BOOKS:

R1: Aho, Hopcroft & Ullman, 'The Design and Analysis of Computer Algorithms', Addison Wesley publications

R2: Thomas H. Cormen et al, 'Introduction to Algorithms', PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction, Divide and conquer

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	03.01.2024		TLM1	
2.	Algorithm definition and Specifications	1	04.01.2024		TLM1	
3.	Performance Analysis	1	05.01.2024		TLM1	
4.	Time Complexity and space complexity	2	06.01.2024 & 10.01.2024		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	11.01.2024		TLM1	
6.	Divide & Conquer Technique: General Method	1	12.01.2024		TLM1	
7.	Binary Search and its analysis	1	18.01.2024		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	19.01.2024		TLM1	
9.	Merge sort and its Analysis	1	20.01.2024		TLM1	
10.	Quick Sort algorithm and its analysis	1	24.01.2024		TLM1	
11.	Closest pair of points	1	25.01.2024		TLM1	
12.	Tutorial - 1	1	27.01.2024		TLM3	
No. of classes required to complete UNIT-I		13		No of classes taken		

UNIT-II: The Greedy method

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Greedy Method – Introduction, General method	1	31.01.2024		TLM1	

15.	Knapsack problem, Example problem	2	01.02.2024 & 02.02.2024		TLM1	
16.	Job sequencing with deadlines, Example problem	1	03.02.2024		TLM1	
17.	Minimum cost spanning trees, example problem	2	07.02.2024 & 08.02.2024		TLM1	
18.	Optimal storage on tapes, Example problem	1	09.02.2024		TLM1	
19.	Single source shortest path problem	2	14.02.2024 & 15.02.2024		TLM1	
20.	Huffman coding	1	16.02.2024		TLM1	
21.	Tutorial – II / Quiz - II	1	17.02.2024		TLM3	
No. of classes required to complete UNIT-II		11		No of classes taken		

UNIT-III: Dynamic Programming

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.	Dynamic Programming- General method	1	21.02.2024		TLM1	
23.	Multistage Graph, Example problem	2	22.02.2024 & 23.02.2024		TLM1	
24.	All pairs shortest path, Example problem	2	24.02.2024 & 06.03.2024		TLM1	
25.	Optimal Binary Search Tree, Example problem	2	07.03.2024 & 13.03.2024		TLM1	
26.	0/1 Knapsack Problem	1	14.03.2024		TLM1	
27.	Travelling Salesperson Problem	2	15.03.2024 & 16.03.2024		TLM1	
28.	Single source shortest path problem, Example Problem	1	20.03.2024		TLM1	
29.	Reliability design, Example Problem	2	21.03.2024 & 22.03.2024		TLM1	
30.	Tutorial – III / Quiz - III	1	23.03.2024		TLM3	
No. of classes required to complete UNIT-III		14		No of classes taken		

UNIT-IV: Back tracking

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	General Method	1	27.03.2024		TLM1	
32.	The 8-Queens problem	2	28.03.2024 & 30.03.2024		TLM1	
33.	Sum of subsets problem	2	03.04.2024 & 04.04.2024		TLM1	
34.	Graph coloring problem	2	06.04.2024		TLM1	
35.	Hamiltonian cycles	1	10.04.2024		TLM1	
36.	Tutorial – IV / Quiz - IV	1	12.04.2024		TLM3	
No. of classes required to complete UNIT-IV		09		No of classes taken		

UNIT-V: Branch and Bound

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.	Branch and Bound-General method-job sequencing with deadlines	1	18.04.2024		TLM1	
44.	LC Branch and bound solution for Travelling Salesperson Problem	1	19.04.2024		TLM2	
45.	LC Branch and bound solution 0/1 Knapsack problem	1	20.04.2024		TLM2	
46.	FIFO Branch and bound solution for Travelling Sales Person Problem	1	24.04.2024		TLM2	
47.	FIFO Branch and bound solution 0/1 Knapsack problem	1	25.04.2024		TLM2	
48.	LIFO Branch and Bound	1	26.04.2024		TLM2	
49.	Tutorial – V / Quiz – V Discussion about SEE	1	27.04.2024		TLM3	
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

PART-C

EVALUATION PROCESS (R20 Regulations):

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 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 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.
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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.

Course Instructor
Dr. M. Sitha Ram

Course Coordinator
Dr. M. Sitha Ram

Module Coordinator
Dr K Naga Prasanthi

HOD
Dr.D.Veeraiah

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. R. Ashok

Course Name&Code : Data Warehousing & Data Mining(20CS10)

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

Credits:3

Program/Sem-Sec : B.Tech/IV-A

A.Y.:2023-24

PREREQUISITES : DBMS and Probability and Statistics

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Objective of the course is to introduce the concepts of datawarehouse and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data warehousing concepts.

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

CO1	Summarize the architecture of data warehouse. (Understand-L2)
CO2	Apply different preprocessing methods, Similarity, Dissimilarity measures for any given raw data. (Apply-L3)
CO3	Construct a decision tree and resolve the problem of model overfitting. (Analyze-L4)
CO4	Compare Apriori and FP-growth association rule mining algorithms for frequent itemset generation. (Apply - L3)
CO5	Apply suitable clustering algorithm for the given dataset. (Apply-L3)

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
CO1	2	2	1	-	-	-	-	-	-	-	-	1	1	-	3
CO2	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO3	2	3	2	2	-	-	-	-	-	-	-	2	-	2	2
CO4	2	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO5	2	2	2	2	-	-	-	-	-	-	-	2	2	2	-
	1 - Low			2 - Medium						3 - High					

TEXTBOOKS:

T1 Data Mining concepts and Techniques, 3rd Edition, Jiawei Han, Michel Kamber, Elsevier, 2011.

T2 Introduction to Data Mining: Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Fifth Impression, Pearson, 2015.

REFERENCE BOOKS:

R1 Data Mining Techniques and Applications: An Introduction, Hongbo Du, Cengage Learning, 2010.

R2 Data Mining: Introductory and Advanced topics: Dunham, First Edition, Pearson, 2020

R3 Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH, 2008.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Data Warehouse and OLAP Technology

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	03.01.2024		TLM1,2	
2.	An Overview: Data Warehouse	1	05.01.2024		TLM1,2	
3.	An Overview: Data Mining	1	06.01.2024		TLM1,2	
4.	Multidimensional Data Model	1	08.01.2024		TLM1,2	
5.	Data Warehouse Architecture	1	10.01.2024		TLM1,2	
6.	Data Warehouse Implementation	1	12.01.2024		TLM1,2	
7.	From Data Warehousing to Data Mining	1	19.01.2024		TLM1,2	
No. of classes required to complete UNIT-I:07				No. of classes taken:		

UNIT-II: Data Mining & Data Preprocessing

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.	Data Mining: Introduction to Data Mining	1	20.01.2024		TLM1,2	
2.	Motivating challenges, The origins of Data Mining,	1	22.01.2024		TLM1,2	
3.	Data Mining Tasks, Types of Data, Data Quality.	1	24.01.2024		TLM1,2	
4.	Data Preprocessing: Aggregation	1	27.01.2024		TLM1,2	
5.	Data Preprocessing: Sampling, Dimensionality, Reduction, Feature Subset Selection	2	29.01.2024 & 31.01.2024		TLM1,2	
6.	Data Preprocessing: Feature creation	1	02.02.2024		TLM1,2	
7.	Data Preprocessing: Discretization and Binarization	2	03.02.2024 & 05.02.2024		TLM1,2	
8.	Data Preprocessing: Variable Transformation	1	07.02.2024		TLM1,2	
9.	Data Preprocessing: Measures of Similarity and Dissimilarity	2	09.02.2024 & 10.02.2024		TLM1,2	
No. of classes required to complete UNIT -II:12				No. of classes taken:		

UNIT-III:Classification&ModelOverfitting

S. No.	Topicsto becovered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Classification: Basic Concepts, General Approach to solving a classification problem	1	12.02.2024		TLM1,2	
2.	Decision Tree Induction: Working of Decision Tree, building a decision tree	2	14.02.2024 & 16.02.2024		TLM1,2	
3.	Methods for expressing an attribute test conditions, measures for selecting the best split	2	17.02.2024 & 19.02.2024		TLM1,2	
4.	Algorithm for decision tree induction.	2	21.02.2024 & 23.02.2024		TLM1,2	
5.	Model Overfitting: Due to presence of noise, due to lack of representation samples,	1	24.02.2024		TLM1,2	
6.	Evaluating the performance of classifier: holdout method , random sub sampling, cross-validation, bootstrap.	2	4.03.2024 & 6.03.2024		TLM1,2	
7.	BayesTheorem	1	9.03.2024&		TLM1,2	
8.	NaïveBayesClassifier	1	11.03.2024		TLM1,2	
No.ofclassesrequiredtocompleteUNIT-III:12				No.ofclassestaken:		

UNIT-IV:AssociationAnalysis

S. No.	Topicsto becovered	No. ofClassesRe quired	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Association Analysis: Basic Concepts	2	13.03.2024& 15.03.2024		TLM1,2	
2.	Algorithms: Problem Definition, Frequent Item Set Generation	2	16.03.2024& 18.03.2024		TLM1,2	
3.	Apriori Principle, Apriori Algorithm	2	20.03.2024& 22.03.2024		TLM1,2	
4.	Rule Generation	2	23.03.2024& 27.03.2024		TLM1,2	
5.	Compact Representation of Frequent Itemsets	1	30.03.2024			
6.	FP Growth Algorithm	2	01.04.2024& 04.04.2024		TLM1,2	
No.ofclassesrequiredtocompleteUNIT-IV:11				No.ofclassestaken:		

UNIT-V:MemorySystemDesign,PeripheralDevicesandtheircharacteristics

S. No.	Topicsto becovered	No. ofClasses Required	Tentative Date of Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Cluster Analysis: Basic Concepts and Algorithms: Preliminaries	2	06.04.2024 & 08.04.2024		TLM1,2	
2.	DifferentTypesofClustering,Different TypesofClusters;	1	10.04.2024		TLM1,2	
3.	K-means: The Basic K-meansAlgorithm	1	12.04.2024		TLM1,2	
4.	K-means Additional Issues,Bisecting K-means, StrengthsandWeaknesses;	1	13.04.2024		TLM1,2	
5.	Exercise problems on K-means	1	15.04.2024		TLM1,2	
6.	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm	1	19.04.2024		TLM1,2	
7.	Exercise problems on Agglomerative Hierarchical Clustering Algorithm	1	20.04.2024		TLM1,2	
8.	DBSCAN: Traditional Density Center Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.	1	22.04.2024& 24.04.2024		TLM1,2	
9.	Exercise problems on DBSCAN Algorithm	1	26.04.2024& 27.04.2024		TLM1,2	
No. of classes required to complete UNIT-V: 10				No.ofclassestaken:		

CONTENTBEYONDTHE SYLLABUS:

S. No.	Topicsto becovered	No. ofClasses Required	Tentative Date of Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign Weekly
1.	RegressionAnalysis - I (LinearRegression)	1	29.04.2014		TLM1,2	
2.	Regression Analysis - II(LogisticRegression)	1	30.04.2014		TLM1,2	

TeachingLearningMethods			
TLM1	ChalkandTalk	TLM4	Demonstration(Lab.FieldVisit)
TLM2	PPT	TLM5	ICT(NPTEL.Swayam Prabha.MOOCs)
TLM3	Tutorial	TLM6	Group Discussion Project

PART-C

PEVALUATIONPROCESS(R20Regulation):

Evaluation Task	Marks
Assignment-I(Units-I,II&UNIT-III(HalfoftheSyllabus))	A1=5
I-DescriptiveExamination(Units-I,II&UNIT-III(HalfoftheSyllabus))	M1=15
I-QuizExamination(Units-I,II&UNIT-III(HalfoftheSyllabus))	Q1=10
Assignment-II(Unit-III(RemainingHalfoftheSyllabus),IV&V)	A2=5
II-DescriptiveExamination(UNIT-III(RemainingHalfoftheSyllabus),IV&V)	M2=15
II-QuizExamination(UNIT-III(RemainingHalfofthe Syllabus),IV&V)	Q2=10
MidMarks =80%of Max ((M1+Q1+A1),(M2+Q2+A2))+ 20%ofMin((M1+Q1+A1), (M2+Q2+A2))	M=30
CumulativeInternalExamination(CIE):M	30
SemesterEndExamination(SEE)	70
TotalMarks =CIE +SEE	100

PART-D

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 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.

PROGRAMMESPECIFICOUTCOMES(PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using 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 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	Mr. R. Ashok	Dr K Naga Prasanthi	Dr. Y.V. Bhaskar Reddy	Dr.D.Veeraiah
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. Sudhakar

Course Name & Code : Operating Systems -20CS11

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

Credits: 3

Program/Sem/Sec : II B.tech/IV-sem/A-Sec

A.Y.: 2023-24

PREREQUISITE: Knowledge of Computer fundamentals & Data structures & algorithms

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objective of the course is to provide basic knowledge of computer operating system structure and functioning. Students able to understand how Operating Systems evolved with advent of computer architecture. Comprehend the different CPU scheduling algorithms, page replacement algorithms, and identify best one.

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

CO1	Demonstrate the underlying principles and techniques of operating system (Understand-L2)
CO2	Interpret scheduling and communication methods of processes handled by operating systems (Understand-L2)
CO3	Distinguish the process synchronization methods and deadlock handling approaches employed in operating systems (Understand-L2)
CO4	Classify memory management techniques and virtual memory mechanisms (Understand-L2)
CO5	Interpret the strategies of disk scheduling algorithms and file system architecture (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	2															
CO2		2	1													
CO3		2	1													
CO4		2	1													
CO5		2	1													
		1 - Low			2 - Medium				3 - High							

TEXTBOOKS:

T1 Silberschatz & Galvin, –Operating System Concepts||, Wiley, 7th edition, 2007.

REFERENCE BOOKS:

- R1 William Stallings, —Operating Systems, PHI, 5th Edition, 2004.
 R2 B.A.Forounz & R.F. Giberg,---Unix and shell programming,Thomson,first Edition,New Delhi,2003
 R3 <http://codex.cs.yale.edu/avi/os-book/os9/slide-dir/index.html>
 R4 http://swayam.gov.in/ndl_noc19_cs50/preview

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	03-1-2024		TLM2	
2.	Introduction to Operating systems	1	04-1-2024		TLM2	
3.	Introduction to Operating systems	1	06-1-2024		TLM2	
4.	Introduction to Operating systems	1	08-1-2024		TLM2	
5.	Operating system services and user operating system interfaces	1	10-1-2024		TLM2	
6.	System calls and types of system calls	1	11-1-2024		TLM2	
7.	System programs, OS design and implementation	1	20-1-2024		TLM2	
8.	OS structure and Virtual Machine	1	22-1-2024		TLM2	
9.	OS generation and System Boot	1	24-1-2024		TLM2	
No. of classes required to complete UNIT-I: 9				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.	Concepts and process scheduling	1	25-1-2024		TLM2	
11.	Operations on process	1	27-1-2024		TLM2	
12.	IPC and examples on IPC	1	29-1-2024		TLM2	
13.	Communication in client server systems	1	31-1-2024		TLM2	
14.	Treads overview, Multithreading Models,	1	01-2-2024		TLM2	
15.	Thread libraries and Thread issues	1	03-2-2024		TLM2	
16.	Scheduling Criteria	1	05-2-2024		TLM2	
17.	Scheduling algorithms	1	07-2-2024		TLM2	
18.	Scheduling algorithms	1	08-2-2024		TLM2	
19.	Multi-Processor Scheduling	1	12-2-2024		TLM2	
No. of classes required to complete UNIT-II: 10				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
20.	The Critical section problem, Peterson's solutions	1	14-2-2024		TLM1	
21.	Synchronization hardware	1	15-2-2024		TLM1	
22.	Semaphores	1	17-2-2024		TLM1	

23.	Classic problems of Synchronization	1	19-2-2024		TLM1
24.	Monitors	1	21-2-2024		TLM1
25.	Synchronization examples	1	22-2-2024		TLM1
26.	atomic transactions	1	24-2-2024		TLM1
27.	System model and deadlock characterization	1	04-3-2024		TLM1
28.	Methods for Handling deadlocks and deadlock prevention	1	06-3-2024		TLM1
29.	Deadlock Avoidance	1	07-3-2024		TLM1
30.	Deadlock detection	1	11-3-2024		TLM1
31.	Recovery from deadlock	1	13-3-2024		TLM1
No. of classes required to complete UNIT-III: 12					

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
32.	Swapping	1	14-3-2024		TLM1	
33.	Contiguous Memory Allocation	1	16-3-2024		TLM1	
34.	Paging and structure of a page table	1	18-3-2024		TLM1	
35.	Segmentation	1	20-3-2024		TLM1	
36.	Demand paging	1	21-3-2024		TLM1	
37.	Page replacement	1	23-3-2024		TLM1	
38.	Allocation of frames	1	27-3-2024		TLM1	
39.	Thrashing	1	28-3-2024		TLM1	
40.	Memory mapped files	1	30-3-2024		TLM1	
41.	Allocating kernel memory	1	28-3-2024		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.	Overview of Mass storage structure	1	30-3-2024		TLM2	
43.	Disk structure	1	01-4-2024		TLM2	
44.	Disk Attachment	1	03-4-2024		TLM2	
45.	Disk Scheduling	1	04-4-2024		TLM2	
46.	Disk Management	1	06-4-2024		TLM2	
47.	The Concept of a file and access methods	1	08-4-2024		TLM2	
48.	File System structure	1	10-4-2024		TLM2	
49.	File system implementation	1	15-4-2024		TLM2	
50.	Directory implementation	1	18-4-2024		TLM2	
51.	Allocation methods	1	20-4-2024		TLM2	

52.	Free space management	1	22-4-2024		TLM2	
53.	Efficiency and performance	1	24-4-2024		TLM2	
54.	Recovery	1	25-4-2024		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 (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. A. Sudhakar	Dr. B. Siva Rama Krishna	Dr. D. Venkata Subbaiah	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [A Section]
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Ms. T. VINEETHA

1. **Pre-requisites:** Object Oriented Programming.

2. **Course Educational Objectives (CEOs):**

The objective of the course is to provide 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, the quality assurance can be achieved.

3. **Course Outcomes (COs):** At the end of this course, the student will be able to:

- CO 1 Apply the fundamentals of software engineering concepts and software process models. **(Apply-L3)**
- CO 2 Apply the requirement elicitation techniques for preparing SRS and design engineering. **(Apply-L3)**
- CO 3 Illustrate the basic building blocks of UML, Class and object diagrams. **(Understand-L2)**
- CO 4 Apply the behavioral models for real world applications. **(Apply-L3)**
- CO 5 Demonstrate different software testing approaches for testing the real time applications. **(Understand-L2)**

Syllabus

UNIT – I:

Software and software Engineering: The evolving role of Software, Characteristics of Software, Importance of software Engineering, Changing nature of software, Legacy Software, Software Myths.

Software Process and Process Models: Layered technology, Process frame work, The process and Product, software process models, the water fall model, incremental model, the spiral and V Model, Component based s/w development, Unified process model,

UNIT – II:

Requirements Analysis and Software design: Requirements gathering and analysis, software requirements specifications (SRS).

Design Engineering: overview of design process, Design Concepts, Architectural Concepts

UNIT – III:

Design Using UML: Building Blocks of UML, Defining things, relationships and diagrams, Common Mechanism in UML, Class and Object Diagrams

UNIT – IV:

Behavioral Modeling: Interactions, Interaction diagrams, use cases, Use case Diagrams, Activity Diagrams, Events and signals, state machines, processes and Threads, time and space, state chart diagrams

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT – V:

Testing Techniques: Software testing fundamentals, Unit testing, Integration testing, Black box testing, white box testing, Debugging, System testing.

4. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	-	2	-	-	-	3
CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	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).

COURSE DELIVERY PLAN (LESSON PLAN): Section-B**UNIT -I:**

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.	The evolving role of Software	2	02/01/24 04/01/24		TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	2	06/01/24 08/01/24		TLM2	CO1	T1	
3.	Legacy Software & Imp of S/W Engg	1	09/01/24		TLM2	CO1	T1	
4.	Software Myths	1	11/01/24		TLM2	CO1	T1	
5.	S/W Process Models: Layered technology	1	18/01/24		TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	20/01/24		TLM2	CO1	T1,R1	
7.	Software Process Models	1	22/01/24		TLM2	CO1	T1,R1	
8.	Waterfall Model	1	23/01/24		TLM2	CO1	T1,R1	
9.	Incremental Model	1	25/01/24		TLM2	CO1	T1	

10.	Spiral and v model	1	27/01/24		TLM2	C01	T1,R1	
11.	Component based s/w development	1	29/01/24		TLM2	C01	T1,R1	
12.	ASSIGNMENT -2	1	30/01/24		TLM2	C01	T1,R1	
No. of classes required to complete UNIT-I		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Requirements analysis &S/W design: Requirements gathering & Analysis	2	01/02/24 03/02/24		TLM2	C02	T1	
14.	Software Requirements Specification (SRS)	2	05/02/24 06/02/24		TLM2	C02	T1	
15.	Design Engineering: Overview of design process	2	08/02/24 12/02/24		TLM2	C02	T1	
16.	Design Concepts	1	13/02/24		TLM2	C02	T1	
17.	Architectural Concepts	1	15/02/2024		TLM2	C02	T1	
18.	ASSIGNMENT-2	1	17/02/24		TLM3	C02	T1	
No. of classes required to complete UNIT-2		9			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	Building Blocks of UML	2	19/02/24 20/02/24		TLM2	CO3	T1	
20.	Defining Things	1	22/02/24		TLM2	CO3	T1	
21.	Relationships &Diagrams	1	24/02/24		TLM2	CO3	T1	
22.	Common mechanism in UML	2	04/03/24 05/03/24		TLM2	CO3	T1,R1	
23.	Class & Object diagrams	1	07/03/24		TLM2	CO3	T1,R1	
24.	ASSIGNMENT-3	1	09/03/24		TLM3	CO3	T1	
No. of classes required to complete UNIT-3		8			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
25.	Behavioral Modelling: Interactions	2	11/03/24 12/03/24		TLM2	CO4	T1	
26.	Interaction diagrams	1	14/03/24		TLM2	CO4	T1	
27.	Use cases, Use case diagrams	1	16/03/24		TLM2	CO4	T1	
28.	Activity diagrams	1	18/03/24		TLM2	CO4	T1,R1	
29.	Events & Signals	1	19/03/24		TLM2	CO4	T1,R1	
30.	State Machines	1	21/03/24		TLM2	CO4	T1	
31.	Processes & Threads	1	23/03/24		TLM2	CO4	T1	
32.	Time &Space	1	25/03/24		TLM2	CO4	T1	
33.	State Chart diagrams	1	26/03/24		TLM2	CO4	T1	

34.	Architectural Modeling: Component, Deployment	2	28/03/24 30/04/24		TLM2	C04	T1	
35.	Component, Deployment diagrams	1	01/04/24		TLM2	C04	T1	
36.	ASSIGNMENT-4	1	02/04/24		TLM3	C04	T1,R1	
No. of classes required to complete UNIT-4		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Testing techniques: Software Testing Fundamentals	2	04/04/24 06/04/24		TLM2	C05	T1	
38.	Unit testing	1	08/04/24		TLM2	C05	T1	
39.	Integration Testing	1	13/04/24		TLM2	C05	T1,R1,R2	
40.	Black Box Testing	1	15/04/24		TLM2	C05	T1,R1,R2	
41.	White Box Testing	2	18/04/24 20/04/24		TLM2	C05	T1	
42.	Debugging	2	22/04/24 23/04/24		TLM2	C05	T1	
43.	System Testing	2	25/04/24		TLM2	C05	T1,R1,R2	
44.	ASSIGNMENT-5	1	27/04/24		TLM3	C05	T1,R1,R2	
No. of classes required to complete UNIT-5		13			No. of classes taken:			

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	Units	Marks
Assignment– 1	1	A1=5
Assignment– 2	2	A2=5
I-Mid Examination	1,2	B1=15
Online Quiz-1	1,2	C1=10
Assignment– 3	3	A3=5
Assignment– 4	4	A4=5
Assignment– 5	5	A5=5
II-Mid Examination	3,4,5	B2=15
Online Quiz-2	3,4,5	C2=10
Evaluation of Assignment: $A = \text{Avg}(\text{Best of Four}(A1, A2, A3, A4, A5))$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B = 75\% \text{ of Max}(B1, B2) + 25\% \text{ of Min}(B1, B2)$	1,2,3,4,5	B=15
Evaluation of Online Quiz Marks: $C = 75\% \text{ of Max}(C1, C2) + 25\% \text{ of Min}(C1, C2)$	1,2,3,4,5	C=10
Attendance Marks based on Percentage of attendance		D=5
Cumulative Internal Examination : $A+B+C+D$	1,2,3,4,5	30
Semester End Examinations : E	1,2,3,4,5	70
Total Marks: $A+B+C+D+E$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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.
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.
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.
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.
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.
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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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):

1. Programming Paradigms:

The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.

2. Data Engineering:

The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

3. Software Engineering:

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. T. Vineetha	Dr.J.Nageswara rao	Dr. Y. Vijaya Bhasakar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE-A sec
ACADEMIC YEAR : 2023 - 24
COURSE NAME & CODE : UNIVERSAL HUMAN VALUES2 -20HS01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr CH V NARAYANA
COURSE COORDINATOR : Dr CH V NARAYANA
MODULE COORDINATOR:
PRE-REQUISITE: Nil

COURSE OBJECTIVE: The objective of the course is to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

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

- CO1:** Apply the value inputs in life and profession (Apply – L3)
CO2: Distinguish between values and skills, happiness and accumulation of physical facility, the self, and the Body (Understand – L2)
CO3: Understand the role of a human being in ensuring harmony in society (Understand-L2)
CO4: Understand the role of a human being in ensuring harmony in the nature and coexistence (Understand-L2)
CO5: Distinguish between ethical and unethical practices (Apply – L3)

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
CO1						1	1	2							
CO2						2	1	2	1						
CO3						1	3	1	3						
CO4							3	1	2						
CO5						1	1	3	2						

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

TEXT BOOK/S:

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

REFERENCES:

1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**UNIT – 1**

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 and need of Value Education.	1	02/01/24		TLM1	CO1	T1	
2.	Basic guide lines, Content of Value Education	1	03/01/24		TLM1	CO1	T1	
3.	Process for Value Education	1	05/01/24		TLM1	CO1	T1	
4.	The process for self-exploration	1	06/01/24		TLM1	CO1	T1, R1	
5.	The process for self-exploration- NA, EV	1	09/01/24		TLM1	CO1	T1, R1	
6.	Continuous Happiness and Prosperity- A look at basic Human Aspirations	2	10/01/24 & 12/01/24		TLM1	CO1	T1, R1	
7.	Right understanding of Relationship and Physical Facility	1	19/01/24		TLM1	CO1	T1	
8.	Understanding Happiness and Prosperity	1	20/01/24		TLM1	CO1	T1	
No. of classes required to complete UNIT-I:		09	No. of classes taken:					

UNIT – 2

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
9.	Understanding human being	1	23/01/24		TLM1	CO2	T1	
10.	Understanding the needs & activities of Self ('I') and 'Body'	1	24/01/24		TLM1	CO2	T1	
11.	Understanding the Body as an instrument of Self	2	27/01/24 & 30/01/24		TLM1	CO2	T1	
12.	Understanding the characteristics and	2	31/01/24 & 02/02/24		TLM1	CO2	T1	

	activities of 'I' and harmony in 'I';							
13.	Understanding the harmony of I with the Body	1	03/02/24		TLM1	CO2	T1, R1	
14.	Indications of Body Health	1	06/02/24		TLM1	CO2	T1, R1	
15.	correct appraisal of Physical needs, meaning of Prosperity in detail	1	07/02/24		TLM1	CO2	T1, R1	
No. of classes required to complete UNIT-II:		09	No. of classes taken:					

UNIT – 3

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.	Understanding values in human-human relationship	1	09/02/24		TLM1	CO3	T1	
17.	meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness	3	13/02/24, 14/02/24 & 16/02/24		TLM1	CO3	T1	
18.	Trust and Respect as the foundational values of relationship	2	17/02/24 & 20/02/24		TLM1	CO3	T1	
19.	Respect in the relationship	1	21/02/24		TLM1	CO3	T1, R1	
20.	Respect in the relationship	2	23/02/24 &24/02/24		TLM1	CO3	T1, R1	
21.	MID EXAMINATION		26-02-24 & 02-03-24					
22.	Other feelings in the relationship	2	05/03/24 &06/03/24		TLM1	CO3	T1	
23.	Other feelings in the relationship	1	12/03/24		TLM1	CO3	T1	
24.	Reverence in the relationship	1	13/03/24		TLM1	CO3	T1	
25.	Justice in the relationship	1	15/03/24		TLM1	CO3	T1, R1	
No. of classes required to complete UNIT-III		14	No. of classes taken:					

UNIT – 4

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
26.	Understanding harmony in the Nature	1	16/03/24		TLM1	CO4	T1	
27.	Understanding existence as coexistence	2	19/03/24 & 20/03/24		TLM1	CO4	T1	
28.	Understanding existence as coexistence	1	22/03/24		TLM1	CO4	T1	
29.	Understanding existence as coexistence	2	23/03/24 & 26/03/24		TLM1	CO4	T1	

30.	Holistic perception of harmony at all levels of existence.	2	27/03/24 & 30/03/24		TLM1	CO4	T1	
No. of classes required to complete UNIT-IV		08	No. of classes taken:					

UNIT - 5

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.	Natural acceptance of human values;	2	02/04/24 & 03/04/24		TLM1	CO5	T2, R4	
32.	Definitiveness of Ethical Human Conduct	2	06/04/24 & 10/04/24		TLM1	CO5	T2, R4	
33.	Basis for Humanistic Education,	2	12/04/24 & 16/04/24		TLM1	CO5	T2, R4	
34.	Humanistic Constitution and Humanistic Universal Order;	2	19/04/24 & 20/04/24		TLM1	CO5	T2, R4	
35.	Competence in professional ethics,	1	23/04/24		TLM1	CO5	T2, R4	
36.	Strategy for transition from the present state to Universal Human Order	1	24/04/24		TLM1	CO5	T2, R4	
No. of classes required to complete UNIT-V		10	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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Pollution-Human Role	1	26/04/24					
38.	Mutual-Enrichment	1	27/04/24					

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Descriptive Examination	1, 2	B1=15

I-Mid Online Quiz Examination	1, 2	C1 = 10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Descriptive Examination	3, 4, 5	B2=15
II-Mid Online Quiz Examination	3, 4, 5	C2 = 10
Evaluation of Assignment/Quiz Marks: $A = (A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Descriptive Marks: $B = 75\% \text{ of Max}(B1,B2) + 25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=15
Evaluation of Mid Online Quiz Marks: $C = \text{Average}(C1, C2)$	1,2,3,4,5	C=10
Cumulative Internal Examination : $A+B+C$	1,2,3,4,5	A+B+C=30
Semester End Examinations	1,2,3,4,5	D=70
Total Marks: $A+B+C+D$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: Pursue higher education, entrepreneurship, and research to compete at global level.

PEO II: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO III: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO IV: Serve ever-changing needs of the society with a pragmatic perception.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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. CH V NARAYANA	Dr. CH V NARAYANA		Dr. D VEERAI AH
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. L. Bhagya Lakshmi
 Course Name & Code : Environmental Science & 20MC03
 L-T-P Structure : 2-0-0 Credits : 0
 Program/Sem/Sec : B.Tech., CSE-A., IV-Sem., SEC-A A.Y : 2023-24

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management.

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).

TEXT BOOKS:

- T1** Anubha Kaushik, C.P.Kaushik, "Perspectives in Environmental Studies", New age international publishers, 5th Edition, Delhi, 2016.
- T2** Mahua Basu, S. Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 1st Edition, Delhi, 2016.

REFERENCE BOOKS:

- R1** S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.
- R2** R. Rajagopalan, "*Environmental Studies (From Crisis to Cure)*", Oxford University Press, 2nd Edition, New Delhi, 2012.
- R3** De, A.K, "Environmental Chemistry", New Age International (P) Limited, 5th Edition, New Delhi, 2003.
- R4** Dr.K.V.S.G. Murali Krishna, "Environmental Studies", VGS Techno Series, 1st Edition, Vijayawada, 2010.
- R5** G. Tyler Miller, Scott Spoolman, "Introduction to Environmental Studies", Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS**

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 of course and course objectives. Introduction of components of Environment	1	04-01-2024		2	
2.	Population explosion and variations among Nations.	1	05-01-2024		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	11-01-2024		2	
4.	Environmental Hazards	1	12-01-2024		2	
5.	Role of Information Technology in environmental management and human health.	1	18-01-2024		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

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 classification of Natural resources, Forest Resources,	1	19-01-2024		2	
2.	Water Resources	1	25-01-2024		2	
3.	Mineral Resources	1	01-02-2024		2	
4.	Food Resources	1	02-02-2024		2	
5.	Energy Resources	1	08-02-2024		2	
6.	Food Resources	1	09-02-2024		2	
No. of classes required to complete UNIT-II: 6				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

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.	Definition, structure and functions of an ecosystem	1	15-02-2024		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	16-02-2024		2	

3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species,	1	22-02-2024		2	
4.	Bio-geographical classification of India. India as a mega diversity nation	1	23-02-2024		2	
5.	I MID EXAMINATION	1	29-02-2024			
6.	I MID EXAMINATION	1	01-03-2024			
7.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	07-03-2024		2	
8.	Man and wild life conflicts. Endangered and endemic species of India	1	14-03-2024		2,3	
9.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	15-03-2024		2	
No. of classes required to complete UNIT-III: 6				No. of classes taken:		

UNIT-IV : ENVIRONMENTAL POLLUTION

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.	Air Pollution	1	21-03-2024		2	
2.	Causes, effects and control measures of: Water Pollution	1	22-03-2024		2	
3.	Causes, effects and control measures of: Soil Pollution,	1	28-03-2024			
4.	Noise Pollution		04-04-2024			
5.	Solid Waste Management	1	12-04-2024		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	18-04-2024		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL 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
1.	Sustainable Development	1	19-04-2024		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	25-04-2024		2,3	
3.	Environmental Impact Assessment (EIA), Green building, Environmental Law	1	26-05-2024		2	
4.	II MID EXAMINATIONS	1	02-05-2024		2	
5.	II MID EXAMINATIONS	1	03-05-2024		2	
No. of classes required to complete UNIT-V: 03				No. of classes taken:		

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
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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 & 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. L. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr R. Ashok
Course Name & Code : Data Mining using Python Lab (20CS58)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-A A.Y: 2023-24

PRE-REQUISITE : Python Programming.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this lab is to Practical exposure on implementation of well-known data mining algorithms and Learning performance evaluation of data mining algorithms in a supervised and an unsupervised setting.

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

CO 1	Apply preprocessing techniques on real world datasets. (Apply-L3)
CO 2	Apply Apriori algorithm to generate frequent itemsets (Apply L3)
CO 3	Apply Classification and clustering algorithms on different datasets(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	1	-	-	-	-	-	-	-	-	1	1	-	3
CO2	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO3	2	3	2	2	-	-	-	-	-	-	-	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	Data preprocessing tasks using python libraries – Loading, Dealing with Missing Data	3	04.01.24		TLM4	
2	Data preprocessing tasks using python libraries – Dealing with Categorical Data, Scaling data,	3	11.01.24		TLM4	

	Splitting data				
3	Similarity and Dissimilarity Measures using python	6	18.01.24& 25.01.24		TLM4
4	Build a model using linear regression algorithm on any dataset.	6	01.02.24& 08.02.24		TLM4
5	Build a classification model using Decision Tree algorithm on iris dataset	6	15.02.24& 22.02.24		TLM4
6	Apply Naïve Bayes Classification algorithm on any dataset	3	07.03.24		TLM4
7	Generate frequent item sets using Apriori Algorithm in python	3	14.03.24		TLM4
8	Genera teassociation rules for any marketbasket data.	3	21.03.24		TLM4
9	Apply K- Means clustering algorithm on any dataset.	3	28.03.24		TLM4
10	Apply Hierarchical Clustering algorithm on any dataset.	3	04.04.24		TLM4
11	Apply DBSCAN clustering algorithm on any dataset.	3	18.04.24		TLM4
12	Internal Examination	3	25.04.24		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.
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 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. R. Ashok	Dr.K.NagaPrasanthi	Dr.Y.V. Bhaskar Reddy	Dr. D. Veeraiah
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.

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A Sudhakar

Course Name & Code : OPERATING SYSTEMS LAB&20CS59

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

Credits:1.5

Program/Sem/Sec : B.Tech. - CSE/IV/A

A.Y.:2023-24

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this lab is to provide the various UNIX/Linux operating system commands, importance of System calls, Scheduling algorithms and Memory Management techniques.

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

CO1	Experiment with Unix commands and shell programming (Understand- L2)
CO2	Implement CPU scheduling algorithms and memory management Techniques(Apply- L3).
CO3	Simulate process synchronization and file system management using system calls(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	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
			1 - Low			2 -Medium			3 - High						

REFERENCE BOOKS:

R1	Silberschatz & Galvin, "Operating System Concepts", Wiley, 7th edition, 2007.
R2	William Stallings, "Operating Systems", PHI, 5th Edition, 2004.
R3	Operating Systems Design and Implementation 3rd Edition by Andrew Tanenbaum (Author), Albert Woodhull (Author)

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	05-1-24		DM5	
2.	Lab Cycle-1	3	19-1-24		DM5	
3.	Lab Cycle -1	3	02-2-24		DM5	
4.	Lab Cycle-2	3	09-2-24		DM5	
5.	Lab Cycle-2	3	16-2-24		DM5	
6.	Lab Cycle-2	3	23-2-24		DM5	
7.	Lab Cycle-3	3	01-3-24		DM5	
8.	Lab Cycle-3	3	15-3-24		DM5	
9.	Lab Cycle-4	3	22-3-24		DM5	
10.	Lab Cycle5	3	05-4-24		DM5	
11.	Lab Cycle6	3	12-4-24		DM5	
12.	Lab Cycle7 & 8	3	19-4-24		DM5	
13.	Internal exam	3	26-4-24		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-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. A. Sudhakar	Dr. B. Siva Rama Krishna	Dr. D. Venkata Subbaiah	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [A Section]
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : SOFTWARE ENGINEERING LAB & 20IT55
L-T-P STRUCTURE : 0-0-3
COURSE CREDITS : 1.5
COURSE INSTRUCTOR : Ms. T. VINEETHA

Pre-requisites: Object Oriented Programming.

Course Educational Objectives (CEOs):

The main objective of this course is that a student will be familiar with principles behind the Object-Oriented Design and able to apply those principles in a project setting. Students will analyze applications and know how to take a pragmatic approach to software design and development.

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

- CO 1 Analyze Software Requirements for the given Real-World Application using Use Cases. **(Analyze-L4)**
- CO 2 Develop the UML Diagrams to view Software System in static aspects. **(Analyze-L4)**
- CO 3 Develop the UML Diagrams to view Software System in dynamic aspects. **(Analyze-L4)**
- CO 4 Improve individual / teamwork skills, communication & report writing skills with ethical values.

5. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	2	-	-	-	3

CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	3
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Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'
1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High).

REFERENCE BOOK(S):

1. Roger S. Pressman, "Software engineering- A practitioner's Approach", TMH International Edition, 6th edition, 2005.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language UserGuide", Pearson Education, 2nd Edition, ISBN: 0-201-57168-4, 1998.
3. Meilir Page-Jones, "Fundamentals of Object-Oriented Design in UML", Pearson Education, 1st Edition, ISBN: 9788177586770, 8177586777, and 2007.
4. Robert B. Jackson, Stephen D. Burd, John W. Satzinger, "Object-Oriented Analysis and Design with the Unified Process", Cengage Learning, 1st Edition, ISBN: 9788131502693, 8131502694, 2007.
5. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", PHI, 3rd Edition, ISBN: 978- 0131489066, 2004.

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 UML Diagrams	3	03/01/24		DM5	
2.	Lab Cycle-1	3	10/01/24		DM5	
3.	Lab Cycle -2	6	24/01/24 31/01/24		DM5	
4.	Lab Cycle-3	3	07/02/24		DM5	
5.	Lab Cycle-4	3	14/02/24		DM5	
6.	Lab Cycle-5	3	21/02/24		DM5	
7.	Lab Cycle-6,7	6	06/03/24 13/03/24		DM5	
8.	Lab Cycle-8	3	20/03/24		DM5	
9.	Lab Cycle-9,10	6	27/03/24 03/04/24		DM5	
10.	Lab Cycle-11	3	10/04/24		DM5	
11.	Internal exam	3	24/04/24		DM5	

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.
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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
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	knowledge of, and need for sustainable development.
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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	Ms. T. Vineetha	Dr.J.Nageswararao	Dr. Y. Vijaya Bhasakar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. Nagarjuna Reddy

Course Name & Code : Web Application Development using Full Stack - Module-II
 (Backend Development) & 20CSS2

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

Credits: 2

Program/Sem/Sec : B.Tech. – CSE/IV/A

A.Y.: 2023-24

PREREQUISITE: Object Oriented Programming and Data Base Management Systems.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is to learn the importance of client-server architecture in the web application development and able to develop dynamic data driven web applications by using advanced java technologies (Servlets, JSP, Struts2 and Hibernate framework).

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

CO1	Apply JDBC concepts to establish the communication between Java Applications and database. (Apply-L3)
CO2	Develop Static and Dynamic Web Applications by using Servlets and Java Server Pages (JSP). (Apply L3)
CO3	Develop Dynamic Data Driven Web Applications by using Struts2 and Hibernate frameworks. (Apply L3)
CO4	Improve individual / teamwork skills, communication & report writing skills withethical 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	-	2	-	-	-	-	-	-	-	-	1	3
CO2	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO3	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
	1 - Low			2 -Medium						3 - High					

REFERENCE BOOKS:

R1	Herbert Schildt, "Java: The complete reference", TMH Publications, 7th edition, 2006.
R2	Kathy Sierra & Bert Bates, "Headfirst Servlets and JSP: Passing the Sun Certified Web Component Developer Exam", O'Reilly Publications Second Edition.
R3	Budi Kurniawan, "Struts 2 Design and Programming: A Tutorial", BrainySoftware, 2nd Edition, 2008.
R4	Christian Bauer, Gavin King, Gary Gregory "Java Persistence with Hibernate: Revised Edition of Hibernate in Action Paperback", Manning Publication, 2nd Edition, 2006.
R5	Santosh Kumar K, "JDBC 4.2, Servlet 3.1, and JSP 2.3 Includes JSF 2.2 and Design Patterns, Black Book", Dreamtech publication, 2ndEdition.

R6	Mahmoud Parsian, "JDBC Recipes: A Problem-Solution Approach", Apress.
R7	Madhusudhan Konda, "Just Hibernate, A Lightweight Introduction to the Hibernate Framework", O'Reilly Media.
R8	Chuck Cavaness, "Programming Jakarta Struts", O'Reilly Media, 2nd Edition.

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.	JDBC	4	02-01-2024		DM5	
2.	Module-1	4	09-01-2024		DM5	
3.	Module-1	4	23-01-2024		DM5	
4.	Module-2	4	30-01-2024		DM5	
5.	Module-2	4	06-02-2024		DM5	
6.	Project Tables Design	4	13-02-2024		DM5	
7.	Servlets	4	20-02-2024		DM5	
8.	Module-3	4	05-03-2024		DM5	
9.	Module-3	4	12-03-2024		DM5	
10.	Module-4	4	19-03-2024		DM5	
11.	Project Design Phase-1	4	26-03-2024		DM5	
12.	JSP	4	02-04-2024		DM5	
13.	Module-5	4	09-04-2024		DM5	
14.	Module-6	4	16-04-2024		DM5	
15.	Final Project	4	23-04-2024		DM5	

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 Regulation):

Evaluation Task	Marks
Report	10
Quality of work	10
Presentation	20
Interaction / Queries	10
Total	50

PART-D:
PROGRAM OUTCOMES

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 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 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

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. S. Nagarjuna Reddy)	(Dr. S. Nagarjuna Reddy)	(Dr. Y.V.B.REDDY)	(Dr. D. Veeraiah)
Signature				



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.N V NAIK

Course Name & Code : DAA & 20CS06

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

Credits: 3

Program/Sem/Sec :BTECH/IV/B

A.Y.: 2023-24

PREREQUISITE: Data structures and DMS

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of the course is to learn various algorithm design techniques and analyze the computing resources of the algorithms and motivate the students to design new algorithms for various problems.

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

CO1	Identify the characteristic of an algorithm and analyses its time and space complexity. (UnderstandL2)
CO2	Apply the divide-and-conquer method for solving problems like searching and sorting. (Apply - L3)
CO3	Design Greedy algorithms for the optimization problems like knapsack problem, minimum cost spanning tree, single source shortest path problem. (Apply - L3)
CO4	Apply dynamic programming paradigm to solve optimization problems like travelling salesperson problem,0/1 knapsack problem, Optimal binary search tree (Apply - L3)
CO5	Analyze the backtracking and branch and bound search methods on optimization Problems like N-queen, sum of subsets.0/1 knapsack, Hamiltonian circuit and so on. (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	3	3	2	-	-	-	-	-	-	-	-	-	3		
CO2	2	3	1	-	-	-	-	-	-	-	-	-	3		
CO3	2	3	1	-	-	-	-	-	-	-	-	-	3		
CO4	2	3	1	-	-	-	-	-	-	-	-	-	1		
CO5	2	3	1	-	-	-	-	-	-	-	-	-	1		
			1 - Low					2 -Medium					3 - High		

TEXTBOOKS:

T1	T1: Ellis Horowitz, SartajSahni, 'Fundamentals of Computer Algorithms', Galgotia Publications.
T2	T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson , 2007.

REFERENCE BOOKS:

R1	Aho, Hopcroft& Ullman, 'The Design and Analysis of Computer Algorithms', Addison Wesley publications
R2	Thomas H. Cormen et al, 'Introduction to Algorithms', PHI.

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	1	02/01/24		TLM1	
2.	Algorithm definition and Specifications	1	03/01/24		TLM1	
3.	Performance Analysis	1	04/01/24		TLM1	
4.	Time Complexity and space complexity	2	06/01/24 09/01/24		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	11/01/24		TLM1	
6.	Divide & Conquer Technique: General Method	1	18/01/24		TLM1	
7.	Binary Search and its analysis	1	20/01/24		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	23/01/24		TLM1	
9.	Merge sort and its Analysis	1	24/01/24		TLM1	
10.	Quick Sort algorithm and its analysis	1	25/01/24		TLM1	
11.	Closest pair of points	1	27/01/24		TLM1	
12.	Tutorial – 1	1	30/01/24		TLM3	
No. of classes required to complete UNIT-I: 13				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
13.	Greedy Method –Introduction, General method	1	31/01/24		TLM1	
14.	Knapsack problem, Example problem	2	01/02/24 03/02/24		TLM1	
15.	Job sequencing with deadlines, Example problem	1	06/02/24		TLM1	
16.	Minimum cost spanning trees, example problem	2	07/02/24 08/02/24		TLM1	
17.	Optimal storage on tapes, Example problem	1	10/02/24		TLM1	
18.	Single source shortest path problem	1	13/02/24		TLM1	
19.	Huffman coding	1	14/02/24		TLM1	
20.	Tutorial – II / Quiz – II	1	15/02/24		TLM3	
No. of classes required to complete UNIT-II: 10				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
21.	Dynamic Programming-General method	1	17/02/24		TLM1	
22.	Multistage Graph, Example	2	20/02/24 21/02/24		TLM1	

23.	All pairs shortest path, Example problem	2	22/02/24 24/02/24		TLM1
24.	Optimal Binary Search Tree, Example problem	2	05/03/24 06/03/24		TLM1
25.	0/1 Knapsack Problem	2	07/03/24 09/03/24		TLM1
26.	Travelling Salesperson Problem	2	12/03/24 13/03/24		TLM1
27.	Single source shortest path problem, Example Problem	1	14/03/24		TLM1
28.	Reliability design, Example Problem	2	16/03/24 19/03/24		TLM1
29.	Tutorial – III / Quiz – III	1	20/03/24		TLM3
No. of classes required to complete UNIT-III: 15				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	HOD Sign Weekly
30.	General Method	1	21/03/24		TLM1	
31.	The 8-Queens problem	2	23/03/24 26/03/24		TLM2	
32.	Sum of subsets problem	2	27/03/24 28/03/24		TLM2	
33.	Graph coloring problem	2	30/03/24 02/04/24		TLM2	
34.	Hamiltonian cycles	1	03/04/24		TLM2	
35.	Tutorial – IV / Quiz – IV	1	04/04/24		TLM3	
No. of classes required to complete UNIT-IV: 09				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
36.	Branch and Bound-General method-job sequencing with deadlines	2	06/04/24 08/04/24		TLM1	
37.	LC Branch and bound solution for Travelling Salesperson Problem	2	10/04/24 13/04/24		TLM1	
38.	LC Branch and bound solution 0/1 Knapsack problem	2	16/04/24 18/04/24		TLM1	
39.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	20/04/24 23/04/24		TLM1	
40.	FIFO Branch and bound solution 0/1 Knapsack problem	1	24/05/23		TLM1	
41.	LIFO Branch and Bound	1	25/04/24		TLM1	
42.	Tutorial – V / Quiz - V	1	27/04/24		TLM3	
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 (R20 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):

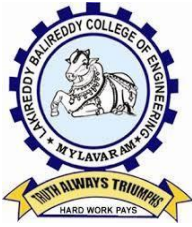
PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 4	Conduct investigations of complex problems: Use research-based 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 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 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.Sitaram	Dr.Y V BHASKAR REDDY	Dr.D Veeraiah
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr K Naga Prasanthi
Course Name & Code : Data Mining using Python Lab (20CS58)
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech. CSE,IV-Sem./B A.Y : 2023-24

PRE-REQUISITE : Python Programming.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this lab is to Practical exposure on implementation of well-known data mining algorithms and Learning performance evaluation of data mining algorithms in a supervised and an unsupervised setting.

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

CO 1	Apply preprocessing techniques on real world datasets. (Apply-L3)
CO 2	Apply Apriori algorithm to generate frequent item sets (Apply L3)
CO 3	Apply Classification and clustering algorithms on different data sets (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	1	-	-	-	-	-	-	-	-	1	1	-	3
CO2	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO3	2	3	2	2	-	-	-	-	-	-	-	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
	Introduction- Practice on Python Programming	3	2-1-24			
1	Data preprocessing tasks using python libraries – Loading, Dealing with Missing Data	3	9-1-24		TLM4	
2	Data preprocessing tasks using python libraries – Dealing with Categorical Data, Scaling data, Splitting data	3	23-1-24		TLM4	
3	Similarity and Dissimilarity Measures using python	3	30-1-24		TLM4	
4	Build a model using linear regression algorithm on any dataset.	3	6-2-24		TLM4	
5	Build a classification model using Decision Tree algorithm on iris dataset	3	13-2-24		TLM4	
6	Apply Naïve Bayes Classification algorithm on any dataset	3	20-2-24		TLM4	
7	Generate frequent item sets using Apriori Algorithm in python	3	5-3-24		TLM4	
8	Generate association rules for any market basket data.	3	5-3-2023		TLM4	
9	Apply K- Means clustering algorithm on any dataset.	3	12-3-24		TLM4	
10	Apply Hierarchical Clustering algorithm on any dataset.	3	19-3-24		TLM4	
11	Apply DBSCAN clustering algorithm on any dataset.	3	26-3-24		TLM4	
12	Practise Session	3	2-4-24		TLM4	
13	Practise Session	3	16-4-24		TLM4	
15	Internal Examination	3	23-4-24		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):

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Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. K Naga Prasanthi	Dr. K Naga Prasanthi	Dr. Y Vijaya Bhaskar Reddy	Dr.D.Veeraiah
Signature				

COURSE DELIVERY PLAN (LESSON PLAN):**UNIT-I: Data Warehouse and OLAP Technology**

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 Course and COs	1	4-1-24		TLM1, 2	
2.	Introduction to Unit-I	1	5-1-24			
3.	Data Warehouse and OLAP Technology: An Overview: Data Warehouse	1	6-1-24		TLM1, 2	
4.	Data Warehouse and OLAP Technology: Multidimensional Data Model	2	8-1-24 11-1-24		TLM1, 2	
5.	Data Warehouse and OLAP Technology: Data Warehouse Architecture	2	12-1-24 18-1-24		TLM1, 2	
6.	Data Warehouse and OLAP Technology: Data Warehouse Implementation	1	19-1-24		TLM1, 2	
7.	Data Warehouse and OLAP Technology: From Data Warehousing to Data Mining.	2	20-1-24 22-1-24		TLM1, 2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: Data Mining & Data Preprocessing

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.	Data Mining: Introduction to Data Mining	1	25-1-24		TLM1,2	
2.	Motivating challenges, The origins of Data Mining,	1	27-1-24		TLM1,2	
3.	Data Mining Tasks, Types of Data, Data Quality.	2	29-1-24 1-2-24		TLM1,2	
4.	Data Preprocessing: Aggregation	1	2-2-24		TLM1,2	
5.	Data Preprocessing: Sampling, Dimensionality Reduction, Feature Subset Selection	2	3-2-24 5-2-24		TLM1,2	
6.	Data Preprocessing: Feature creation	1	8-2-24		TLM1,2	
7.	Data Preprocessing: Discretization and Binarization	1	9-2-24		TLM1,2	
8.	Data Preprocessing: Variable Transformation	1	12-2-24		TLM1,2	
9.	Data Preprocessing: Measures of Similarity and Dissimilarity	1	15-2-24		TLM1,2	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: Classification & Model Over fitting

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.	Classification: Basic Concepts, General Approach to solving a classification problem	1	16-2-24		TLM1,2	
2.	Decision Tree Induction: Working of Decision Tree, building a decision tree	2	17-2-24 19-2-24		TLM1,2	
3.	methods for expressing an attribute test conditions, measures for selecting the best split	2	22-2-24 23-2-24		TLM1,2	
4.	Algorithm for decision tree induction.	1	24-2-24		TLM1,2	
5.	Model Overfitting: Due to presence of noise, due to lack of representation samples,	1	4-3-24		TLM1,2	
6.	Evaluating the performance of classifier: holdout method, random sub sampling, cross-validation, bootstrap.	2	7-3-24 11-3-24		TLM1,2	
7.	Bayes Theorem	2	14-3-24 15-3-24		TLM1,2	
8.	Naïve Bayes Classifier	1	16-3-24		TLM1,2	
No. of classes required to complete UNIT-III: 12				No. of classes taken:		

UNIT-IV: Association 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
1.	Association Analysis: Basic Concepts	2	18-3-24 21-3-24		TLM1,2	
2.	Algorithms: Problem Definition, Frequent Item Set Generation	2	22-3-24 23-3-24		TLM1,2	
3.	Apriori Principle, Apriori Algorithm	2	28-3-24 30-3-24		TLM1,2	
4.	Rule Generation, Compact Representation of Frequent Itemsets	2	1-4-24 4-4-24		TLM1,2	
5.	FPGrowth Algorithm	2	6-4-24 8-4-24		TLM1,2	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: Cluster 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
1.	Cluster Analysis: Basic Concepts and Algorithms: Preliminaries	1	12-4-24		TLM1,2	
2.	Different Types of Clustering, Different Types of Clusters;	1	15-4-24		TLM1,2	
3.	K-means: The Basic K-means Algorithm	1	18-4-24		TLM1,2	
4.	K-means Additional Issues, Bisecting K-means, Strengths and Weaknesses;	1	19-4-24		TLM1,2	
5.	Exercise problems on K-means	1	20-4-24		TLM1,2	
6.	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm	1	22-4-24		TLM1,2	
7.	Exercise problems on Agglomerative Hierarchical Clustering Algorithm	1	25-4-24		TLM1,2	
8.	DBSCAN: Traditional Density Center-Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.	1	26-4-24		TLM1,2	
9.	Exercise problems on DBSCAN Algorithm	1	27-4-24		TLM1,2	
No. of classes required to complete UNIT-V: 09				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	HOD Sign Weekly
1.	Regression Analysis - I (Linear Regression)	1	27-4-24		TLM1,2	

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

PEVALUATION PROCESS (R20 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

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Name of the Faculty	Dr. K Naga Prasanthi	Dr. K Naga Prasanthi	Dr Y Vijaya Bhaskar Reddy	Dr. D. Veeraiah
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [B Section] **ACADEMIC YEAR** : 2023-24

COURSE NAME & CODE : SOFTWARE ENGINEERING LAB & 20IT55

L-T-P STRUCTURE : 0-0-3

COURSE CREDITS : 1.5

COURSE INSTRUCTOR: N.Srikanth

Pre-requisites: Object Oriented Programming.

Course Educational Objectives (CEOs):

The main objective of this course is that a student will be familiar with principles behind the Object- Oriented Design and able to apply those principles in a project setting. Students will analyze applications and know how to take a pragmatic approach to software design and development.

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

- CO 1 Analyze Software Requirements for the given Real-World Application using UseCases. **(Analyze-L4)**
- CO 2 Develop the UML Diagrams to view Software System in static aspects. **(Analyze-L4)**
- CO 3 Develop the UML Diagrams to view Software System in dynamic aspects. **(Analyze-L4)**
- CO 4 Improve individual / teamwork skills, communication & report writing skills with ethical values.

5. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	2	-	-	-	3
CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	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).

REFERENCE BOOK(S):

1. Roger S. Pressman, "Software engineering- A practitioner's Approach", TMH International Edition, 6th edition, 2005.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language UserGuide", Pearson Education, 2nd Edition, ISBN: 0-201-57168-4, 1998.
3. Meilir Page-Jones, "Fundamentals of Object-Oriented Design in UML", Pearson Education, 1st Edition, ISBN: 9788177586770, 8177586777, and 2007.
4. Robert B. Jackson, Stephen D. Burd, John W. Satzinger, "Object-Oriented Analysis and Design with the Unified Process", Cengage Learning, 1st Edition, ISBN: 9788131502693, 8131502694, 2007.
5. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", PHI, 3rd Edition, ISBN: 978- 0131489066, 2004.

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 UML Diagrams	3	5/01/24		DM5	
2.	Lab Cycle-1	3	12/01/24		DM5	
3.	Lab Cycle -2	6	19/01/24 02/02/24		DM5	
4.	Lab Cycle-3	3	09/02/24		DM5	
5.	Lab Cycle-4	3	16/02/24		DM5	
6.	Lab Cycle-5	3	23/02/24		DM5	
7.	Lab Cycle-6,7	3	15/03/24		DM5	
8.	Lab Cycle-8	3	22/03/24		DM5	
9.	Lab Cycle-9,10	3	12/04/24		DM5	
10.	Lab Cycle-11	3	19/04/24		DM5	
11.	Internal exam	3	26/04/24		DM5	

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):

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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	Mr.N.Srikanth	Dr.J.Nageswararao	Dr. Y. Vijaya Bhasakar Reddy	Dr. D. Veeraiah
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.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [B Section]
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Mr.N.Srikanth

1. **Pre-requisites:** Object Oriented Programming.

2. **Course Educational Objectives (CEOs):**

The objective of the course is to provide 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, the quality assurance can be achieved.

3. **Course Outcomes (COs):** At the end of this course, the student will be able to:

- CO 1 Apply the fundamentals of software engineering concepts and software process models. **(Apply-L3)**
- CO 2 Apply the requirement elicitation techniques for preparing SRS and design engineering. **(Apply-L3)**
- CO 3 Illustrate the basic building blocks of UML, Class and object diagrams. **(Understand-L2)**
- CO 4 Apply the behavioral models for real world applications. **(Apply-L3)**
- CO 5 Demonstrate different software testing approaches for testing the real time applications. **(Understand-L2)**

Syllabus

UNIT – I:

Software and software Engineering: The evolving role of Software, Characteristics of Software, Importance of software Engineering, Changing nature of software, Legacy Software, Software Myths.

Software Process and Process Models: Layered technology, Process frame work, The process and Product, software process models, the water fall model, incremental model, the spiral and V Model, Component based s/w development, Unified process model,

UNIT – II:

Requirements Analysis and Software design: Requirements gathering and analysis, software requirements specifications (SRS).

Design Engineering: overview of design process, Design Concepts, Architectural Concepts

UNIT – III:

Design Using UML: Building Blocks of UML, Defining things, relationships and diagrams, Common Mechanism in UML, Class and Object Diagrams

UNIT – IV:

Behavioral Modeling: Interactions, Interaction diagrams, use cases, Use case Diagrams, Activity Diagrams, Events and signals, state machines, processes and Threads, time and space, state chart diagrams

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT – V:

Testing Techniques: Software testing fundamentals, Unit testing, Integration testing, Black box testing, white box testing, Debugging, System testing.

4. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	-	2	-	-	-	3
CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	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).

COURSE DELIVERY PLAN (LESSON PLAN): Section-B**UNIT -I:**

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.	The evolving role of Software	2	03/01/24 04/01/24		TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	2	06/01/24 08/01/24		TLM2	CO1	T1	
3.	Legacy Software & Imp of S/W Engg	1	10/01/24		TLM2	CO1	T1	
4.	Software Myths	1	11/01/24		TLM2	CO1	T1	
5.	S/W Process Models: Layered technology	1	18/01/24		TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	20/01/24		TLM2	CO1	T1,R1	
7.	Software Process Models	1	22/01/24		TLM2	CO1	T1,R1	
8.	Waterfall Model	1	24/01/24		TLM2	CO1	T1,R1	
9.	Incremental Model	1	25/01/24		TLM2	CO1	T1	

10.	Sprial and v model	1	27/01/24		TLM2	C01	T1,R1	
11.	Component based s/w development	1	29/01/24		TLM2	C01	T1,R1	
12.	ASSIGNMENT -2	1	31/01/24		TLM2	C01	T1,R1	
No. of classes required to complete UNIT-I		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Requirements analysis &S/W design: Requirements gathering & Analysis	2	01/02/24 03/02/24		TLM2	C02	T1	
14.	Software Requirements Specification (SRS)	2	05/02/24 07/02/24		TLM2	C02	T1	
15.	Design Engineering: Overview of design process	2	08/02/24 12/02/24		TLM2	C02	T1	
16.	Design Concepts	1	14/02/24		TLM2	C02	T1	
17.	Architectural Concepts	1	15/02/2024		TLM2	C02	T1	
18.	ASSIGNMENT-2	1	17/02/24		TLM3	C02	T1	
No. of classes required to complete UNIT-2		9			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	Building Blocks of UML	2	19/02/24 21/02/24		TLM2	CO3	T1	
20.	Defining Things	1	22/02/24		TLM2	CO3	T1	
21.	Relationships &Diagrams	1	24/02/24		TLM2	CO3	T1	
22.	Common mechanism in UML	2	04/03/24 06/03/24		TLM2	CO3	T1,R1	
23.	Class & Object diagrams	1	07/03/24		TLM2	CO3	T1,R1	
24.	ASSIGNMENT-3	1	09/03/24		TLM3	CO3	T1	
No. of classes required to complete UNIT-3		8			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
25.	Behavioral Modelling: Interactions	2	11/03/24 13/03/24		TLM2	CO4	T1	
26.	Interaction diagrams	1	14/03/24		TLM2	CO4	T1	
27.	Use cases, Use case diagrams	1	16/03/24		TLM2	CO4	T1	
28.	Activity diagrams	1	18/03/24		TLM2	CO4	T1,R1	
29.	Events & Signals	1	20/03/24		TLM2	CO4	T1,R1	
30.	State Machines	1	21/03/24		TLM2	CO4	T1	
31.	Processes & Threads	1	23/03/24		TLM2	CO4	T1	
32.	Time &Space	1	27/03/24		TLM2	CO4	T1	
33.	State Chart diagrams	1	28/03/24		TLM2	CO4	T1	

34.	Architectural Modeling: Component, Deployment	2	30/03/24 01/04/24		TLM2	C04	T1	
35.	Component, Deployment diagrams	1	03/04/24		TLM2	C04	T1	
36.	ASSIGNMENT-4	1	04/04/24		TLM3	C04	T1,R1	
No. of classes required to complete UNIT-4		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Testing techniques: Software Testing Fundamentals	2	06/04/24 08/04/24		TLM2	C05	T1	
38.	Unit testing	1	10/04/24		TLM2	C05	T1	
39.	Integration Testing	1	13/04/24		TLM2	C05	T1,R1,R2	
40.	Black Box Testing	1	15/04/24		TLM2	C05	T1,R1,R2	
41.	White Box Testing	2	18/04/24 20/04/24		TLM2	C05	T1	
42.	Debugging	2	22/04/24 24/04/24		TLM2	C05	T1	
43.	System Testing	2	25/04/24		TLM2	C05	T1,R1,R2	
44.	ASSIGNMENT-5	1	27/04/24		TLM3	C05	T1,R1,R2	
No. of classes required to complete UNIT-5		13			No. of classes taken:			

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	Units	Marks
Assignment– 1	1	A1=5
Assignment– 2	2	A2=5
I-Mid Examination	1,2	B1=15
Online Quiz-1	1,2	C1=10
Assignment– 3	3	A3=5
Assignment– 4	4	A4=5
Assignment– 5	5	A5=5
II-Mid Examination	3,4,5	B2=15
Online Quiz-2	3,4,5	C2=10
Evaluation of Assignment: $A = \text{Avg}(\text{Best of Four}(A1, A2, A3, A4, A5))$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B = 75\%$ of $\text{Max}(B1, B2) + 25\%$ of $\text{Min}(B1, B2)$	1,2,3,4,5	B=15
Evaluation of Online Quiz Marks: $C = 75\%$ of $\text{Max}(C1, C2) + 25\%$ of $\text{Min}(C1, C2)$	1,2,3,4,5	C=10
Attendance Marks based on Percentage of attendance		D=5
Cumulative Internal Examination : $A+B+C+D$	1,2,3,4,5	30
Semester End Examinations : E	1,2,3,4,5	70
Total Marks: $A+B+C+D+E$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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.
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.
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.
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.
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.
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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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):

1. Programming Paradigms:

The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.

2. Data Engineering:

The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

3. Software Engineering:

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.Srikanth	Dr.J.Nageswararao	Dr. Y. Vijaya Bhasakar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor : Mr. MD. Amanatulla
Course Name & Code : Web Application Development using Full Stack -Module-II
 (Backend Development) & 20CSS1
L-T-P Structure : 1-0-2 **Credits:2**
Program/Sem/Sec : B.Tech. –CSE/IV/B **A.Y.:2023-24**

PRE-REQUISITE: Object Oriented Programming and Data Base Management Systems.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is to learn the importance of client-server architecture in the web application development and able to develop dynamic data driven web applications by using advanced java technologies (Servlets, JSP, Struts2 and Hibernate framework).

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

CO1	Apply JDBC concepts to establish the communication between Java Applications and database. (Apply-L3)
CO2	Develop Static and Dynamic Web Applications by using Servlets and Java Server Pages (JSP). (Apply L3)
CO3	Develop Dynamic Data Driven Web Applications by using Struts2 and Hibernate frameworks. (Apply L3)
CO4	Improve individual / team work 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	-	-	2	-	2	-	-	-	-	-	-	-	-	1	3
CO2	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO3	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
	1 -Low			2-Medium				3- High							

REFERENCE BOOKS:

R1	Herbert Schildt, "Java: The complete reference", TMH Publications, 7th edition, 2006.
R2	Kathy Sierra & Bert Bates, "Head first Servlets and JSP: Passing the Sun Certified Web Component Developer Exam", O' Reilly Publications Second Edition.
R3	Budi Kurniawan, "Struts2 Design and Programming: A Tutorial", Brainy Software, 2 nd Edition, 2008.

R4	Christian Bauer, Gavin King, Gary Gregory “ Java Persistence with Hibernate: Revised Edition of Hibernate in Action Paper back”, ManningPublication,2ndEdition,2006.
R5	Santosh KumarK, “JDBC4.2, Servlet3.1,andJSP2.3IncludesJSF2.2andDesignPatterns,BlackBook”, Dreamtech publication,2ndEdition.
R6	Mahmoud Parsian,“JDBC Recipes:A Problem-Solution Approach”,Apress.
R7	MadhusudhanKonda, “Just Hibernate, A Lightweight Introduction to the Hibernate Framework”,O'ReillyMedia.
R8	ChuckCavaness,“ProgrammingJakartaStruts”,O'ReillyMedia,2ndEdition.

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.	LabCycle-1	4	08-01-2024		DM5	
2.	LabCycle-2	4	22-01-2024		DM5	
3.	LabCycle-3	4	29-01-2024		DM5	
4.	LabCycle-4	4	05-02-2024		DM5	
5.	Project Design Phase	4	12-02-2024		DM4	
6.	LabCycle-5	4	19-02-2024		DM5	
7.	Project Design Phase	4	26-02-2024		DM4	
8.	LabCycle-6	4	04-03-2024		DM5	
9.	LabCycle-6	4	11-03-2024		DM5	
10.	Project Backend Connectivity	4	18-03-2024		DM4	
11.	LabCycle-7	4	01-04-2024		DM5	
12.	LabCycle-7	4	08-04-2024		DM5	
13.	LabCycle-8	4	15-04-2024		DM5	
14.	Project Execution	4	22-04-2024		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 (R20 Regulation):

Evaluation Task	Marks
Report	10
Quality of work	10
Presentation	20
Interaction/Queries	10
Total	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 an open-source programming environment for the success of the organization.
PSO 2	The ability to design and develop computer programs in networking, web applications, and IoT as per society's 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. Md. Amanatulla)	(Dr. S. Nagarjuna Reddy)	(Dr. Y. V. B. Reddy)	(Dr. D. Veeraiah)
Signature				



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.Sivaramakrishna

Course Name & Code :-OPERATING SYSTEMS Lab&20CS59

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

Credits:1.5

Program/Sem/Sec : B.Tech. - CSE/IV/B

A.Y.:2023-24

PREREQUISITE:Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this lab is to provide the various UNIX/Linuxoperating system commands, importance of System calls, Scheduling algorithms and MemoryManagement techniques.

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

CO1	Experiment with Unix commands and shell programming (Understand- L2)
CO2	Implement CPU scheduling algorithms and memory management Techniques(Apply- L3).
CO3	Simulate process synchronization and file system management using system calls(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	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
			1 - Low			2 -Medium			3 - High						

REFERENCE BOOKS:

R1	Silberschatz& Galvin, “Operating System Concepts”, Wiley, 7th edition, 2007.
R2	William Stallings, “Operating Systems”, PHI, 5th Edition, 2004.
R3	Operating Systems Design and Implementation 3rd Editionby Andrew Tanenbaum (Author), Albert Woodhull (Author)

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	02-1-24		DM5	
2.	Lab Cycle-1	3	09-1-24		DM5	
3.	Lab Cycle -1	3	23-1-24		DM5	
4.	Lab Cycle-2	3	30-1-24		DM5	
5.	Lab Cycle-2	3	06-2-24		DM5	
6.	Lab Cycle-2	3	13-2-24		DM5	
7.	Lab Cycle-3	3	20-2-24		DM5	
8.	Lab Cycle-3	3	05-3-24		DM5	
9.	Lab Cycle-4	3	12-3-24		DM5	
10.	Lab Cycle5	3	19-3-24		DM5	
11.	Lab Cycle6	3	26-3-24		DM5	
12.	Lab Cycle7	3	02-4-24		DM5	
13.	Lab Cycle-8	3	16-4-24		DM5	
14.	Internal exam	3	23-4-24		DM5	

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. Sivaramakrishna	Dr.B. Siva Rama Krishna	Dr.D.VENKATA SUBBAIAH	Dr.V.VEERAAH
Signature				

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Phone: 08659-222933, Fax: 08659-222931



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr B.Sivaramakrishna

Course Name & Code : Operating Systems -20CS11

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

Credits: 3

Program/Sem/Sec : II B.tech/IV-sem/B-Sec

A.Y.: 2023-24

PREREQUISITE: Knowledge of Computer fundamentals & Data structures & algorithms

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objective of the course is to provide basic knowledge of computer operating system structure and functioning. Students able to understand how Operating Systems evolved with advent of computer architecture. Comprehend the different CPU scheduling algorithms, page replacement algorithms, and identify best one.

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

CO1	Demonstrate the underlying principles and techniques of operating system (Understand-L2)
CO2	Interpret scheduling and communication methods of processes handled by operating systems (Understand-L2)
CO3	Distinguish the process synchronization methods and deadlock handling approaches employed in operating systems (Understand-L2)
CO4	Classify memory management techniques and virtual memory mechanisms (Understand-L2)
CO5	Interpret the strategies of disk scheduling algorithms and file system architecture (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	2														
CO2		2	1												
CO3		2	1												
CO4		2	1												
CO5		2	1												
		1 - Low			2 -Medium				3 - High						

TEXTBOOKS:

T1 Silberschatz & Galvin, —Operating System Concepts||, Wiley, 7th edition, 2007.

REFERENCE BOOKS:

R1 William Stallings, —Operating Systems, PHI, 5th Edition, 2004.

R2 B.A.Forounz & R.F. Giberg,---Unix and shell programming,Thomson,first Edition,New Delhi,2003

R3 <http://codex.cs.yale.edu/avi/os-book/os9/slide-dir/index.html>

R4 http://swayam.gov.in/ndl_noc19_cs50/preview

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	03-1-2024		TLM2	
2.	Introduction to Operating systems	1	04-1-2024		TLM2	
3.	Introduction to Operating systems	1	06-1-2024		TLM2	
4.	Introduction to Operating systems	1	08-1-2024		TLM2	
5.	Operating system services and user operating system interfaces	1	10-1-2024		TLM2	
6.	System calls and types of system calls	1	11-1-2024		TLM2	
7.	System programs, OS design and implementation	1	19-1-2024		TLM2	
8.	OS structure and Virtual Machine	1	22-1-2024		TLM2	
9.	OS generation and System Boot	1	24-1-2024		TLM2	
No. of classes required to complete UNIT-I: 9				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.	Concepts and process scheduling	1	25-1-2024		TLM2	
11.	Operations on process	1	27-1-2024		TLM2	
12.	IPC and examples on IPC	1	29-1-2024		TLM2	
13.	Communication in client server systems	1	31-1-2024		TLM2	
14.	Treads overview, Multithreading Models,	1	01-2-2024		TLM2	
15.	Thread libraries and Thread issues	1	03-2-2024		TLM2	
16.	Scheduling Criteria	1	05-2-2024		TLM2	
17.	Scheduling algorithms	1	07-2-2024		TLM2	
18.	Scheduling algorithms	1	08-2-2024		TLM2	
19.	Multi-Processor Scheduling	1	12-2-2024		TLM2	
No. of classes required to complete UNIT-II: 10				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
20.	The Critical section problem, Peterson's solutions	1	14-2-2024		TLM1	
21.	Synchronization hardware	1	15-2-2024		TLM1	
22.	Semaphores	1	17-2-2024		TLM1	

23.	Classic problems of Synchronization	1	19-2-2024		TLM1
24.	Monitors	1	21-2-2024		TLM1
25.	Synchronization examples	1	22-2-2024		TLM1
26.	atomic transactions	1	24-2-2024		TLM1
27.	System model and deadlock characterization	1	04-3-2024		TLM1
28.	Methods for Handling deadlocks and deadlock prevention	1	06-3-2024		TLM1
29.	Deadlock Avoidance	1	07-3-2024		TLM1
30.	Deadlock detection	1	11-3-2024		TLM1
31.	Recovery from deadlock	1	13-3-2024		TLM1
No. of classes required to complete UNIT-III: 12					

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
32.	Swapping	1	14-3-2024		TLM1	
33.	Contiguous Memory Allocation	1	16-3-2024		TLM1	
34.	Paging and structure of a page table	1	18-3-2024		TLM1	
35.	Segmentation	1	20-3-2024		TLM1	
36.	Demand paging	1	21-3-2024		TLM1	
37.	Page replacement	1	23-3-2024		TLM1	
38.	Allocation of frames	1	27-3-2024		TLM1	
39.	Thrashing	1	28-3-2024		TLM1	
40.	Memory mapped files	1	30-3-2024		TLM1	
41.	Allocating kernel memory	1	28-3-2024		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.	Overview of Mass storage structure	1	30-3-2024		TLM2	
43.	Disk structure	1	01-4-2024		TLM2	
44.	Disk Attachment	1	03-4-2024		TLM2	
45.	Disk Scheduling	1	04-4-2024		TLM2	
46.	Disk Management	1	06-4-2024		TLM2	
47.	The Concept of a file and access methods	1	08-4-2024		TLM2	
48.	File System structure	1	10-4-2024		TLM2	
49.	File system implementation	1	15-4-2024		TLM2	
50.	Directory implementation	1	18-4-2024		TLM2	
51.	Allocation methods	1	20-4-2024		TLM2	

52.	Free space management	1	22-4-2024		TLM2	
53.	Efficiency and performance	1	24-4-2024		TLM2	
54.	Recovery	1	25-4-2024		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 (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.
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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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr B.Sivaramakrishna	Dr.B. Siva Rama Krishna	Dr.D.VENKATA SUBBAIAH	Dr.V.VEERAAIAH
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

PROGRAM : B.Tech. IV-Sem., CSE-B sec
ACADEMIC YEAR : 2023 - 24
COURSE NAME & CODE : UNIVERSAL HUMAN VALUES2 -20HS01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr.D.VENKATA SUBBIAH
COURSE COORDINATOR : Dr CH V NARAYANA
MODULE COORDINATOR:
PRE-REQUISITE: Nil

COURSE OBJECTIVE: The objective of the course is to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

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

- CO1:** Apply the value inputs in life and profession (Apply – L3)
CO2: Distinguish between values and skills, happiness and accumulation of physical facility, the self, and the Body (Understand – L2)
CO3: Understand the role of a human being in ensuring harmony in society (Understand-L2)
CO4: Understand the role of a human being in ensuring harmony in the nature and coexistence (Understand-L2)
CO5: Distinguish between ethical and unethical practices (Apply – L3)

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
CO1						1	1	2							
CO2						2	1	2	1						
CO3						1	3	1	3						
CO4							3	1	2						
CO5						1	1	3	2						

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

TEXT BOOK/S:

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

REFERENCES:

1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**UNIT – 1**

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 and need of Value Education.	1	02/01/24		TLM1	CO1	T1	
2.	Basic guide lines, Content of Value Education	1	03/01/24		TLM1	CO1	T1	
3.	Process for Value Education	1	05/01/24		TLM1	CO1	T1	
4.	The process for self-exploration	1	06/01/24		TLM1	CO1	T1, R1	
5.	The process for self-exploration- NA,EV	1	09/01/24		TLM1	CO1	T1, R1	
6.	Continuous Happiness and Prosperity- A look at basic Human Aspirations	2	10/01/24 & 12/01/24		TLM1	CO1	T1, R1	
7.	Right understanding of Relationship and Physical Facility	1	19/01/24		TLM1	CO1	T1	
8.	Understanding Happiness and Prosperity	1	20/01/24		TLM1	CO1	T1	
No. of classes required to complete UNIT-I:		09	No. of classes taken:					

UNIT – 2

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
9.	Understanding human being	1	23/01/24		TLM1	CO2	T1	
10.	Understanding the needs & activities of Self ('I') and 'Body'	1	24/01/24		TLM1	CO2	T1	
11.	Understanding the Body as an instrument of Self	2	27/01/24 & 30/01/24		TLM1	CO2	T1	
12.	Understanding the characteristics and	2	31/01/24 & 02/02/24		TLM1	CO2	T1	

	activities of 'I' and harmony in 'I';							
13.	Understanding the harmony of I with the Body	1	03/02/24		TLM1	CO2	T1, R1	
14.	Indications of Body Health	1	06/02/24		TLM1	CO2	T1, R1	
15.	correct appraisal of Physical needs, meaning of Prosperity in detail	1	07/02/24		TLM1	CO2	T1, R1	
No. of classes required to complete UNIT-II:		09	No. of classes taken:					

UNIT - 3

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.	Understanding values in human-human relationship	1	09/02/24		TLM1	CO3	T1	
17.	meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness	3	13/02/24, 14/02/24 & 16/02/24		TLM1	CO3	T1	
18.	Trust and Respect as the foundational values of relationship	2	17/02/24 & 20/02/24		TLM1	CO3	T1	
19.	Respect in the relationship	1	21/02/24		TLM1	CO3	T1, R1	
20.	Respect in the relationship	2	23/02/24 &24/02/24		TLM1	CO3	T1, R1	
21.	MID EXAMINATION		26-02-24 & 02-03-24					
22.	Other feelings in the relationship	2	05/03/24 &06/03/24		TLM1	CO3	T1	
23.	Other feelings in the relationship	1	12/03/24		TLM1	CO3	T1	
24.	Reverence in the relationship	1	13/03/24		TLM1	CO3	T1	
25.	Justice in the relationship	1	15/03/24		TLM1	CO3	T1, R1	
No. of classes required to complete UNIT-III		14	No. of classes taken:					

UNIT - 4

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
26.	Understanding harmony in the Nature	1	16/03/24		TLM1	CO4	T1	
27.	Understanding existence as coexistence	2	19/03/24 & 20/03/24		TLM1	CO4	T1	
28.	Understanding existence as coexistence	1	22/03/24		TLM1	CO4	T1	
29.	Understanding existence as coexistence	2	23/03/24 & 26/03/24		TLM1	CO4	T1	

30.	Holistic perception of harmony at all levels of existence.	2	27/03/24 & 30/03/24		TLM1	CO4	T1	
No. of classes required to complete UNIT-IV		08	No. of classes taken:					

UNIT - 5

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.	Natural acceptance of human values;	2	02/04/24 & 03/04/24		TLM1	CO5	T2, R4	
32.	Definitiveness of Ethical Human Conduct	2	06/04/24 & 10/04/24		TLM1	CO5	T2, R4	
33.	Basis for Humanistic Education,	2	12/04/24 & 16/04/24		TLM1	CO5	T2, R4	
34.	Humanistic Constitution and Humanistic Universal Order;	2	19/04/24 & 20/04/24		TLM1	CO5	T2, R4	
35.	Competence in professional ethics,	1	23/04/24		TLM1	CO5	T2, R4	
36.	Strategy for transition from the present state to Universal Human Order	1	24/04/24		TLM1	CO5	T2, R4	
No. of classes required to complete UNIT-V		10	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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Pollution-Human Role	1	26/04/24					
38.	Mutual-Enrichment	1	27/04/24					

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Descriptive Examination	1, 2	B1=15

I-Mid Online Quiz Examination	1, 2	C1 = 10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Descriptive Examination	3, 4, 5	B2=15
II-Mid Online Quiz Examination	3, 4, 5	C2 = 10
Evaluation of Assignment/Quiz Marks: $A = (A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Descriptive Marks: $B = 75\% \text{ of Max}(B1,B2) + 25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=15
Evaluation of Mid Online Quiz Marks: $C = \text{Average}(C1, C2)$	1,2,3,4,5	C=10
Cumulative Internal Examination : $A+B+C$	1,2,3,4,5	A+B+C=30
Semester End Examinations	1,2,3,4,5	D=70
Total Marks: $A+B+C+D$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: Pursue higher education, entrepreneurship, and research to compete at global level.

PEO II: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO III: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO IV: Serve ever-changing needs of the society with a pragmatic perception.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 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.
- 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.
- 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.
- 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.
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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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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.
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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.D V SUBBIAH	Dr.CH V NARAYANA		Dr. D VEERIAH
Signature				



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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. L. Bhagya Lakshmi
 Course Name & Code : Environmental Science & 20MC03
 L-T-P Structure : 2-0-0 Credits : 0
 Program/Sem/Sec : B.Tech., CSE-B., IV-Sem., SEC-B A.Y : 2023-24

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management.

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).

TEXT BOOKS:

- T1** Anubha Kaushik, C.P.Kaushik, "Perspectives in Environmental Studies", New age international publishers, 5th Edition, Delhi, 2016.
- T2** Mahua Basu, S. Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 1st Edition, Delhi, 2016.

REFERENCE BOOKS:

- R1** S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.
- R2** R. Rajagopalan, "*Environmental Studies (From Crisis to Cure)*", Oxford University Press, 2nd Edition, New Delhi, 2012.
- R3** De, A.K, "Environmental Chemistry", New Age International (P) Limited, 5th Edition, New Delhi, 2003.
- R4** Dr.K.V.S.G. Murali Krishna, "Environmental Studies", VGS Techno Series, 1st Edition, Vijayawada, 2010.
- R5** G. Tyler Miller, Scott Spoolman, "Introduction to Environmental Studies", Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS**

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 of course and course objectives. Introduction of components of Environment	1	02-01-2024		2	
2.	Population explosion and variations among Nations.	1	04-01-2024		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	09-01-2024		2	
4.	Environmental Hazards	1	12-01-2024		2	
5.	Role of Information Technology in environmental management and human health.	1	19-01-2024		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

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 classification of Natural resources, Forest Resources,	1	23-01-2024		2	
2.	Water Resources	1	30-01-2024		2	
3.	Mineral Resources	1	01-02-2024		2	
4.	Food Resources	1	06-02-2024		2	
5.	Energy Resources	1	08-02-2024		2	
6.	Food Resources	1	13-02-2024		2	
No. of classes required to complete UNIT-II: 6				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

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.	Definition, structure and functions of an ecosystem	1	15-02-2024		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	20-02-2024		2	

3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Biogeographical classification of India. India as a mega diversity nation	1	22-02-2024		2
4.	I MID EXAMINATION	1	27-02-2024		
5.	I MID EXAMINATION	1	29-02-2024		
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	05-03-2024		2
7.	Man and wild life conflicts. Endangered and endemic species of India	1	07-03-2024		2,3
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	12-03-2024		2
No. of classes required to complete UNIT-III: 6				No. of classes taken:	

UNIT-IV : ENVIRONMENTAL POLLUTION

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.	Air Pollution	1	14-03-2024		2	
2.	Causes, effects and control measures of: Water Pollution	1	19-03-2024		2	
3.	Causes, effects and control measures of: Soil Pollution,	1	21-03-2024			
4.	Noise Pollution		26-03-2024			
5.	Solid Waste Management	1	28-03-2024		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	02-04-2024		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL 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
1.	Sustainable Development,	1	04-04-2024		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference,	1	16-04-2024		2,3	
3.	Environmental Impact Assessment (EIA)	1	18-04-2024		2	
4.	Green building		23-04-2024			
5.	Environmental Law		25-04-2024			
6.	II MID EXAMINATIONS	1	30-04-2024		2	
7.	II MID EXAMINATIONS	1	02-05-2024		2	
No. of classes required to complete UNIT-V: 03				No. of classes taken:		

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
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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 & 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. L. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. M. Sitha Ram
Course Name & Code : DAA (20CS06)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CSE., IV-C A.Y: 2023-24

PRE-REQUISITE:Data structures and DMS

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to learn various algorithm design techniques and analyze the computing resources of the algorithms and motivate the students to design new algorithms for various problems.

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

CO 1	Identify the characteristic of an algorithm and analyses its time and space complexity. (UnderstandL2)
CO 2	Apply the divide-and-conquer method for solving problems like searching and sorting. (Apply - L3)
CO 3	Design Greedy algorithms for the optimization problems like knapsack problem, minimum cost spanning tree, single source shortest path problem. (Apply - L3)
CO 4	Apply dynamic programming paradigm to solve optimization problems like travelling salesperson problem,0/1 knapsack problem, Optimal binary search tree (Apply- L3)
CO 5	Analyze the backtracking and branch and bound search methods on optimization problems like N-queen, sum of subsets.0/1 knapsack, Hamiltonian circuit and so on. (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	3	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	2
CO3	2	2	-	1	-	-	-	-	-	-	-	-	-	-	3
CO4	2	3	-	1	-	-	-	-	-	-	-	-	-	-	1
CO5	2	3	1	-	-	-	-	-	-	-	-	-	-	-	1

Note: Enter Correlation Levels 1 or 2 or 3. If there is no correlation, put '-'

1- Slight (Low), 2 - Moderate (Medium), 3 - Substantial (High).

TEXT BOOKS:

T1: Ellis Horowitz, SartajSahni, 'Fundamentals of Computer Algorithms', Galgotia Publications.

T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson ,

2007.

REFERENCE BOOKS:

R1: Aho, Hopcroft & Ullman, 'The Design and Analysis of Computer Algorithms', Addison Wesley publications

R2: Thomas H. Cormen et al, 'Introduction to Algorithms', PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction, Divide and conquer

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	02.01.2024		TLM1	
2.	Algorithm definition and Specifications	1	03.01.2024		TLM1	
3.	Performance Analysis	1	05.01.2024		TLM1	
4.	Time Complexity and space complexity	2	06.01.2024 & 09.01.2024		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	10.01.2024		TLM1	
6.	Divide & Conquer Technique: General Method	1	12.01.2024		TLM1	
7.	Binary Search and its analysis	1	17.01.2024		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	19.01.2024		TLM1	
9.	Merge sort and its Analysis	1	20.01.2024		TLM1	
10.	Quick Sort algorithm and its analysis	1	23.01.2024		TLM1	
11.	Closest pair of points	1	24.01.2024		TLM1	
12.	Tutorial - 1	1	27.01.2024		TLM3	
No. of classes required to complete UNIT-I		13		No of classes taken		

UNIT-II: The Greedy method

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Greedy Method – Introduction, General method	1	30.01.2024		TLM1	

15.	Knapsack problem, Example problem	2	31.01.2024 & 02.02.2024		TLM1	
16.	Job sequencing with deadlines, Example problem	1	03.02.2024		TLM1	
17.	Minimum cost spanning trees, example problem	2	06.02.2024 & 07.02.2024		TLM1	
18.	Optimal storage on tapes, Example problem	1	09.02.2024		TLM1	
19.	Single source shortest path problem	2	13.02.2024 & 14.02.2024		TLM1	
20.	Huffman coding	1	16.02.2024		TLM1	
21.	Tutorial – II / Quiz - II	1	17.02.2024		TLM3	
No. of classes required to complete UNIT-II		11			No of classes taken	

UNIT-III: Dynamic Programming

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.	Dynamic Programming- General method	1	20.02.2024		TLM1	
23.	Multistage Graph, Example problem	2	21.02.2024 & 23.02.2024		TLM1	
24.	All pairs shortest path, Example problem	2	24.02.2024 & 05.03.2024		TLM1	
25.	Optimal Binary Search Tree, Example problem	2	06.03.2024 & 12.03.2024		TLM1	
26.	0/1 Knapsack Problem	1	13.03.2024		TLM1	
27.	Travelling Salesperson Problem	2	15.03.2024 & 16.03.2024		TLM1	
28.	Single source shortest path problem, Example Problem	1	19.03.2024		TLM1	
29.	Reliability design, Example Problem	2	20.03.2024 & 22.03.2024		TLM1	
30.	Tutorial – III / Quiz - III	1	23.03.2024		TLM3	
No. of classes required to complete UNIT-III		14			No of classes taken	

UNIT-IV: Back tracking

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	General Method	1	26.03.2024		TLM1	
32.	The 8-Queens problem	2	27.03.2024 & 30.03.2024		TLM1	
33.	Sum of subsets problem	2	02.04.2024 & 03.04.2024		TLM1	
34.	Graph coloring problem	2	06.04.2024		TLM1	
35.	Hamiltonian cycles	1	10.04.2024		TLM1	
36.	Tutorial – IV / Quiz - IV	1	12.04.2024		TLM3	
No. of classes required to complete UNIT-IV		09		No of classes taken		

UNIT-V: Branch and Bound

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.	Branch and Bound-General method-job sequencing with deadlines	1	16.04.2024		TLM1	
44.	LC Branch and bound solution for Travelling Salesperson Problem	1	19.04.2024		TLM2	
45.	LC Branch and bound solution 0/1 Knapsack problem	1	20.04.2024		TLM2	
46.	FIFO Branch and bound solution for Travelling Sales Person Problem	1	23.04.2024		TLM2	
47.	FIFO Branch and bound solution 0/1 Knapsack problem	1	24.04.2024		TLM2	
48.	LIFO Branch and Bound	1	26.04.2024		TLM2	
49.	Tutorial – V / Quiz – V Discussion about SEE	1	27.04.2024		TLM3	
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

PART-C

EVALUATION PROCESS (R20 Regulations):

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 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 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.
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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.

Course Instructor
Dr. M. Sitha Ram

Course Coordinator
Dr. M. Sitha Ram

Module Coordinator
Dr K Naga Prasanthi

HOD
Dr.D.Veeraiah

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course/Instructor : G.V.Suresh

Course Name & Code : Data Warehousing & Data Mining (20CS10)

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

Credits: 3

Program/Sem-Sec : B.Tech/IV-C

A.Y.: 2023-24

PREREQUISITES : DBMS and Probability and Statistics

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Objective of the course is to introduce the concepts of data warehouse and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data warehousing concepts.

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

C01	Summarize the architecture of data warehouse. (Understand-L2)
C02	Apply different preprocessing methods, Similarity, Dissimilarity measures for any given raw data. (Apply-L3)
C03	Construct a decision tree and resolve the problem of model overfitting. (Analyze-L4)
C04	Compare Apriori and FP-growth association rule mining algorithms for frequent itemset generation. (Apply-L3)
C05	Apply suitable clustering algorithm for the given dataset. (Apply-L3)

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
C01	2	2	1	-	-	-	-	-	-	-	-	1	1	-	3
C02	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
C03	2	3	2	2	-	-	-	-	-	-	-	2	-	2	2
C04	2	2	-	2	-	-	-	-	-	-	-	-	2	-	-
C05	2	2	2	2	-	-	-	-	-	-	-	2	2	2	-
	1 - Low			2 - Medium						3 - High					

TEXTBOOKS:

T1 Data Mining concepts and Techniques, 3rd Edition, Jiawei Han, Michel Kamber, Elsevier, 2011.

T2 Introduction to Data Mining: Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Fifth Impression, Pearson, 2015.

REFERENCE BOOKS:

R1 Data Mining Techniques and Applications: An Introduction, Hongbo Du, Cengage Learning, 2010.

R2 Data Mining: Introductory and Advanced Topics: Dunham, First Edition, Pearson, 2020

R3 Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH, 2008.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Data Warehouse and OLAP Technology

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	03.01.2024		TLM1,2	
2.	An Overview: Data Warehouse	1	05.01.2024		TLM1,2	
3.	An Overview: Data Mining	1	06.01.2024		TLM1,2	
4.	Multidimensional Data Model	2	08.01.2024		TLM1,2	
5.	Data Warehouse Architecture	1	10.01.2024		TLM1,2	
6.	Data Warehouse Implementation	1	12.01.2024		TLM1,2	
7.	From Data Warehousing to Data Mining	1	19.01.2024		TLM1,2	
No. of classes required to complete UNIT-I:08				No. of classes taken:		

UNIT-II: Data Mining & Data Preprocessing

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.	Data Mining: Introduction to Data Mining	1	20.01.2024		TLM1,2	
2.	Motivating challenges, The origins of Data Mining,	1	22.01.2024		TLM1,2	
3.	Data Mining Tasks, Types of Data, Data Quality.	1	24.01.2024		TLM1,2	
4.	Data Preprocessing: Aggregation	1	27.01.2024		TLM1,2	
5.	Data Preprocessing: Sampling, Dimensionality, Reduction, Feature Subset Selection	2	29.01.2024 & 31.01.2024		TLM1,2	
6.	Data Preprocessing: Feature recreation	1	02.02.2024		TLM1,2	
7.	Data Preprocessing: Discretization and Binarization	2	03.02.2024 & 05.02.2024		TLM1,2	
8.	Data Preprocessing: Variable Transformation	1	07.02.2024		TLM1,2	
9.	Data Preprocessing: Measures of Similarity and Dissimilarity	2	09.02.2024 & 10.02.2024		TLM1,2	
No. of classes required to complete UNIT -II:12				No. of classes taken:		

UNIT-III:Classification&ModelOverfitting

S. No.	Topicsto becovered	No. ofClassesR equired	Tentative Date ofCompleto n	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Classification: Basic Concepts, General Approach to solving a classification problem	1	12.02.2024		TLM1,2	
2.	Decision Tree Induction: Working of Decision Tree, building a decision tree	2	14.02.2024 & 16.02.2024		TLM1,2	
3.	Methods for expressing an attribute test conditions, measures for selecting the best split	2	17.02.2024 & 19.02.2024		TLM1,2	
4.	Algorithm for decision tree induction.	2	21.02.2024 & 23.02.2024		TLM1,2	
5.	Model Overfitting: Due to presence of noise, due to lack of representation samples,	1	24.02.2024		TLM1,2	
6.	Evaluating the performance of classifier: holdout method , random sub sampling, cross-validation, bootstrap.	2	4.03.2024 & 6.03.2024		TLM1,2	
7.	BayesTheorem	1	9.03.2024&		TLM1,2	
8.	NaïveBayesClassifier	1	11.03.2024		TLM1,2	
No.ofclassesrequiredtocompleteUNIT-III:12				No.ofclassestaken:		

UNIT-IV:AssociationAnalysis

S. No.	Topicsto becovered	No. ofClassesRe quired	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Association Analysis: Basic Concepts	2	13.03.2024& 15.03.2024		TLM1,2	
2.	Algorithms: Problem Definition, Frequent Item Set Generation	2	16.03.2024& 18.03.2024		TLM1,2	
3.	Apriori Principle, Apriori Algorithm	2	20.03.2024& 22.03.2024		TLM1,2	
4.	Rule Generation	2	23.03.2024& 27.03.2024		TLM1,2	
5.	Compact Representation of Frequent Itemsets	1	30.03.2024			
6.	FP Growth Algorithm	2	01.04.2024& 04.04.2024		TLM1,2	
No.ofclassesrequiredtocompleteUNIT-IV:11				No.ofclassestaken:		

UNIT-V:MemorySystemDesign,PeripheralDevicesandtheircharacteristics

S. No.	Topicsto becovered	No. ofClasses Required	Tentative Date of Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Cluster Analysis: Basic Concepts and Algorithms: Preliminaries	2	06.04.2024 & 08.04.2024		TLM1,2	
2.	DifferentTypesofClustering,Different TypesofClusters;	1	10.04.2024		TLM1,2	
3.	K-means: The Basic K-meansAlgorithm	1	12.04.2024		TLM1,2	
4.	K-means Additional Issues,Bisecting K-means, StrengthsandWeaknesses;	1	13.04.2024		TLM1,2	
5.	Exercise problems on K-means	1	15.04.2024		TLM1,2	
6.	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm	1	19.04.2024		TLM1,2	
7.	Exercise problems on Agglomerative Hierarchical Clustering Algorithm	1	20.04.2024		TLM1,2	
8.	DBSCAN: Traditional Density Center Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.	1	22.04.2024& 24.04.2024		TLM1,2	
9.	Exercise problems on DBSCAN Algorithm	1	26.04.2024& 27.04.2024		TLM1,2	
No. of classes required to complete UNIT-V: 10				No.ofclassestaken:		

CONTENTBEYONDTHE SYLLABUS:

S. No.	Topicsto becovered	No. ofClasses Required	Tentative Date of Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign Weekly
1.	RegressionAnalysis - I (LinearRegression)	1	29.04.2014		TLM1,2	
2.	Regression Analysis - II(LogisticRegression)	1	30.04.2014		TLM1,2	

TeachingLearningMethods			
TLM1	ChalkandTalk	TLM4	Demonstration(Lab.FieldVisit)
TLM2	PPT	TLM5	ICT(NPTEL.Swayam Prabha.MOOCs)
TLM3	Tutorial	TLM6	Group Discussion Project

PART-C

PEVALUATIONPROCESS(R20Regulation):

EvaluationTask	Marks
Assignment-I(Units-I,II&UNIT-III(HalfoftheSyllabus))	A1=5
I-DescriptiveExamination(Units-I,II&UNIT-III(HalfoftheSyllabus))	M1=15
I-QuizExamination(Units-I,II&UNIT-III(HalfoftheSyllabus))	Q1=10
Assignment-II(Unit-III(RemainingHalfoftheSyllabus),IV&V)	A2=5
II-DescriptiveExamination(UNIT-III(RemainingHalfoftheSyllabus),IV&V)	M2=15
II-QuizExamination(UNIT-III(RemainingHalfoftheSyllabus),IV&V)	Q2=10
MidMarks =80%of Max ((M1+Q1+A1),(M2+Q2+A2))+ 20%ofMin((M1+Q1+A1), (M2+Q2+A2))	M=30
CumulativeInternalExamination(CIE):M	30
SemesterEndExamination(SEE)	70
TotalMarks =CIE +SEE	100

PART-D

PROGRAM OUTCOMES(Pos)

P01	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
P02	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.
P03	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.
P04	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.
P05	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.
P06	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.
P07	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.
P08	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
P09	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P010	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.
P011	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.
P012	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 Organization.
PSO2	The ability to design and develop computer programs in networking, web applications and 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	G.V.Suresh	Dr K Naga Prasanthi	Dr K Naga Prasanthi	Dr.D.Veeraiah
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. P. Sarala

Course Name & Code : Operating Systems -20CS11

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

Credits: 3

Program/Sem/Sec : II B.tech/IV-sem/C-Sec

A.Y.: 2023-24

PREREQUISITE: Knowledge of Computer fundamentals & Data structures & algorithms

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objective of the course is to provide basic knowledge of computer operating system structure and functioning. Students able to understand how Operating Systems evolved with advent of computer architecture. Comprehend the different CPU scheduling algorithms, page replacement algorithms, and identify best one.

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

CO1	Demonstrate the underlying principles and techniques of operating system (Understand-L2)
CO2	Interpret scheduling and communication methods of processes handled by operating systems (Understand-L2)
CO3	Distinguish the process synchronization methods and deadlock handling approaches employed in operating systems (Understand-L2)
CO4	Classify memory management techniques and virtual memory mechanisms (Understand-L2)
CO5	Interpret the strategies of disk scheduling algorithms and file system architecture (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	2														
CO2		2	1												
CO3		2	1												
CO4		2	1												
CO5		2	1												
		1 - Low			2 -Medium				3 - High						

TEXTBOOKS:

T1 Silberschatz & Galvin, —Operating System Concepts||, Wiley, 7th edition, 2007.

REFERENCE BOOKS:

- R1 William Stallings, —Operating Systems, PHI, 5th Edition, 2004.
 R2 B.A.Forounz & R.F. Giberg,---Unix and shell programming,Thomson,first Edition,New Delhi,2003
 R3 <http://codex.cs.yale.edu/avi/os-book/os9/slide-dir/index.html>
 R4 <http://swayam.gov.in/ndl noc19 cs50/preview>

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	03-1-2024		TLM2	
2.	Introduction to Operating systems	1	04-1-2024		TLM2	
3.	Introduction to Operating systems	1	06-1-2024		TLM2	
4.	Introduction to Operating systems	1	08-1-2024		TLM2	
5.	Operating system services and user operating system interfaces	1	10-1-2024		TLM2	
6.	System calls and types of system calls	1	11-1-2024		TLM2	
7.	System programs, OS design and implementation	1	20-1-2024		TLM2	
8.	OS structure and Virtual Machine	1	22-1-2024		TLM2	
9.	OS generation and System Boot	1	24-1-2024		TLM2	
No. of classes required to complete UNIT-I: 9				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.	Concepts and process scheduling	1	25-1-2024		TLM2	
11.	Operations on process	1	27-1-2024		TLM2	
12.	IPC and examples on IPC	1	29-1-2024		TLM2	
13.	Communication in client server systems	1	31-1-2024		TLM2	
14.	Treads overview,Multithreading Models,	1	01-2-2024		TLM2	
15.	Thread libraries and Thread issues	1	03-2-2024		TLM2	
16.	Scheduling Criteria	1	05-2-2024		TLM2	
17.	Scheduling algorithms	1	07-2-2024		TLM2	
18.	Scheduling algorithms	1	08-2-2024		TLM2	
19.	Multi-Processor Scheduling	1	12-2-2024		TLM2	
No. of classes required to complete UNIT-II: 10				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
20.	The Critical section problem, Peterson's solutions	1	14-2-2024		TLM1	
21.	Synchronization hardware	1	15-2-2024		TLM1	
22.	Semaphores	1	17-2-2024		TLM1	

23.	Classic problems of Synchronization	1	19-2-2024		TLM1	
24.	Monitors	1	21-2-2024		TLM1	
25.	Synchronization examples	1	22-2-2024		TLM1	
26.	atomic transactions	1	24-2-2024		TLM1	
27.	System model and deadlock characterization	1	04-3-2024		TLM1	
28.	Methods for Handling deadlocks and deadlock prevention	1	06-3-2024		TLM1	
29.	Deadlock Avoidance	1	07-3-2024		TLM1	
30.	Deadlock detection	1	11-3-2024		TLM1	
31.	Recovery from deadlock	1	13-3-2024		TLM1	
No. of classes required to complete UNIT-III: 12						

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
32.	Swapping	1	14-3-2024		TLM1	
33.	Contiguous Memory Allocation	1	16-3-2024		TLM1	
34.	Paging and structure of a page table	1	18-3-2024		TLM1	
35.	Segmentation	1	20-3-2024		TLM1	
36.	Demand paging	1	21-3-2024		TLM1	
37.	Page replacement	1	23-3-2024		TLM1	
38.	Allocation of frames	1	27-3-2024		TLM1	
39.	Thrashing	1	28-3-2024		TLM1	
40.	Memory mapped files	1	30-3-2024		TLM1	
41.	Allocating kernel memory	1	28-3-2024		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.	Overview of Mass storage structure	1	30-3-2024		TLM2	
43.	Disk structure	1	01-4-2024		TLM2	
44.	Disk Attachment	1	03-4-2024		TLM2	
45.	Disk Scheduling	1	04-4-2024		TLM2	
46.	Disk Management	1	06-4-2024		TLM2	
47.	The Concept of a file and access methods	1	08-4-2024		TLM2	
48.	File System structure	1	10-4-2024		TLM2	
49.	File system implementation	1	15-4-2024		TLM2	
50.	Directory implementation	1	18-4-2024		TLM2	
51.	Allocation methods	1	20-4-2024		TLM2	

52.	Free space management	1	22-4-2024		TLM2	
53.	Efficiency and performance	1	24-4-2024		TLM2	
54.	Recovery	1	25-4-2024		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 (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	Ms.P.SARALA	Dr.B. Siva Rama Krishna	Dr.D.VENKATA SUBBAIAH	Dr.D.VEERAI AH
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [C Section]
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. J. Nageswara Rao

1. **Pre-requisites:** Object Oriented Programming.
2. **Course Educational Objectives (CEOs):**

The objective of the course is to provide 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, the quality assurance can be achieved.

3. **Course Outcomes (COs):** At the end of this course, the student will be able to:

- CO 1 Apply the fundamentals of software engineering concepts and software process models. **(Apply-L3)**
- CO 2 Apply the requirement elicitation techniques for preparing SRS and design engineering. **(Apply-L3)**
- CO 3 Illustrate the basic building blocks of UML, Class and object diagrams. **(Understand-L2)**
- CO 4 Apply the behavioral models for real world applications. **(Apply-L3)**
- CO 5 Demonstrate different software testing approaches for testing the real time applications. **(Understand-L2)**

Syllabus

UNIT – I:

Software and software Engineering: The evolving role of Software, Characteristics of Software, Importance of software Engineering, Changing nature of software, Legacy Software, Software Myths.

Software Process and Process Models: Layered technology, Process frame work, The process and Product, software process models, the water fall model, incremental model, the spiral and V Model, Component based s/w development, Unified process model,

UNIT – II:

Requirements Analysis and Software design: Requirements gathering and analysis, software requirements specifications (SRS).

Design Engineering: overview of design process, Design Concepts, Architectural Concepts

UNIT – III:

Design Using UML: Building Blocks of UML, Defining things, relationships and diagrams, Common Mechanism in UML, Class and Object Diagrams

UNIT – IV:

Behavioral Modeling: Interactions, Interaction diagrams, use cases, Use case Diagrams, Activity Diagrams, Events and signals, state machines, processes and Threads, time and space, state chart diagrams

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT – V:

Testing Techniques: Software testing fundamentals, Unit testing, Integration testing, Black box testing, white box testing, Debugging, System testing.

4. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	-	2	-	-	-	3
CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	-	3	1	-	-	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).

COURSE DELIVERY PLAN (LESSON PLAN): Section-B**UNIT -I:**

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.	The evolving role of Software	2	02/01/24 04/01/24		TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	2	06/01/24 08/01/24		TLM2	CO1	T1	
3.	Legacy Software & Imp of S/W Engg	1	09/01/24		TLM2	CO1	T1	
4.	Software Myths	1	11/01/24		TLM2	CO1	T1	
5.	S/W Process Models: Layered technology	1	18/01/24		TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	20/01/24		TLM2	CO1	T1,R1	
7.	Software Process Models	1	22/01/24		TLM2	CO1	T1,R1	
8.	Waterfall Model	1	23/01/24		TLM2	CO1	T1,R1	
9.	Incremental Model	1	25/01/24		TLM2	CO1	T1	

10.	Spiral and v model	1	27/01/24		TLM2	C01	T1,R1	
11.	Component based s/w development	1	29/01/24		TLM2	C01	T1,R1	
12.	ASSIGNMENT -2	1	30/01/24		TLM2	C01	T1,R1	
No. of classes required to complete UNIT-I		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Requirements analysis &S/W design: Requirements gathering & Analysis	2	01/02/24 03/02/24		TLM2	C02	T1	
14.	Software Requirements Specification (SRS)	2	05/02/24 06/02/24		TLM2	C02	T1	
15.	Design Engineering: Overview of design process	2	08/02/24 12/02/24		TLM2	C02	T1	
16.	Design Concepts	1	13/02/24		TLM2	C02	T1	
17.	Architectural Concepts	1	15/02/2024		TLM2	C02	T1	
18.	ASSIGNMENT-2	1	17/02/24		TLM3	C02	T1	
No. of classes required to complete UNIT-2		9			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	Building Blocks of UML	2	19/02/24 20/02/24		TLM2	CO3	T1	
20.	Defining Things	1	22/02/24		TLM2	CO3	T1	
21.	Relationships &Diagrams	1	24/02/24		TLM2	CO3	T1	
22.	Common mechanism in UML	2	04/03/24 05/03/24		TLM2	CO3	T1,R1	
23.	Class & Object diagrams	1	07/03/24		TLM2	CO3	T1,R1	
24.	ASSIGNMENT-3	1	09/03/24		TLM3	CO3	T1	
No. of classes required to complete UNIT-3		8			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
25.	Behavioral Modelling: Interactions	2	11/03/24 12/03/24		TLM2	CO4	T1	
26.	Interaction diagrams	1	14/03/24		TLM2	CO4	T1	
27.	Use cases, Use case diagrams	1	16/03/24		TLM2	CO4	T1	
28.	Activity diagrams	1	18/03/24		TLM2	CO4	T1,R1	
29.	Events & Signals	1	19/03/24		TLM2	CO4	T1,R1	
30.	State Machines	1	21/03/24		TLM2	CO4	T1	
31.	Processes & Threads	1	23/03/24		TLM2	CO4	T1	
32.	Time &Space	1	25/03/24		TLM2	CO4	T1	
33.	State Chart diagrams	1	26/03/24		TLM2	CO4	T1	

34.	Architectural Modeling: Component, Deployment	2	28/03/24 30/04/24		TLM2	C04	T1	
35.	Component, Deployment diagrams	1	01/04/24		TLM2	C04	T1	
36.	ASSIGNMENT-4	1	02/04/24		TLM3	C04	T1,R1	
No. of classes required to complete UNIT-4		14			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Testing techniques: Software Testing Fundamentals	2	04/04/24 06/04/24		TLM2	C05	T1	
38.	Unit testing	1	08/04/24		TLM2	C05	T1	
39.	Integration Testing	1	13/04/24		TLM2	C05	T1,R1,R2	
40.	Black Box Testing	1	15/04/24		TLM2	C05	T1,R1,R2	
41.	White Box Testing	2	18/04/24 20/04/24		TLM2	C05	T1	
42.	Debugging	2	22/04/24 23/04/24		TLM2	C05	T1	
43.	System Testing	2	25/04/24		TLM2	C05	T1,R1,R2	
44.	ASSIGNMENT-5	1	27/04/24		TLM3	C05	T1,R1,R2	
No. of classes required to complete UNIT-5		13			No. of classes taken:			

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	Units	Marks
Assignment– 1	1	A1=5
Assignment– 2	2	A2=5
I-Mid Examination	1,2	B1=15
Online Quiz-1	1,2	C1=10
Assignment– 3	3	A3=5
Assignment– 4	4	A4=5
Assignment– 5	5	A5=5
II-Mid Examination	3,4,5	B2=15
Online Quiz-2	3,4,5	C2=10
Evaluation of Assignment: $A = \text{Avg}(\text{Best of Four}(A1, A2, A3, A4, A5))$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B = 75\% \text{ of Max}(B1, B2) + 25\% \text{ of Min}(B1, B2)$	1,2,3,4,5	B=15
Evaluation of Online Quiz Marks: $C = 75\% \text{ of Max}(C1, C2) + 25\% \text{ of Min}(C1, C2)$	1,2,3,4,5	C=10
Attendance Marks based on Percentage of attendance		D=5
Cumulative Internal Examination : $A+B+C+D$	1,2,3,4,5	30
Semester End Examinations : E	1,2,3,4,5	70
Total Marks: $A+B+C+D+E$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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.
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.
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.
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.
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.
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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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):

1. Programming Paradigms:

The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.

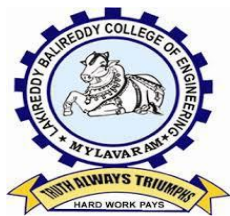
2. Data Engineering:

The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

3. Software Engineering:

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 Bhasakar Reddy	Dr. D. Veeraiah
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE-C sec
ACADEMIC YEAR : 2023 - 24
COURSE NAME & CODE : UNIVERSAL HUMAN VALUES2 -20HS01
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Mrs. B. USHA RANI
COURSE COORDINATOR : Dr CH V NARAYANA
MODULE COORDINATOR: Dr. CH V NARAYANA
PRE-REQUISITE: Nil

COURSE OBJECTIVE: The objective of the course is to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

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

- CO1:** Apply the value inputs in life and profession (Apply – L3)
CO2: Distinguish between values and skills, happiness and accumulation of physical facility, the self, and the Body (Understand – L2)
CO3: Understand the role of a human being in ensuring harmony in society (Understand-L2)
CO4: Understand the role of a human being in ensuring harmony in the nature and coexistence (Understand-L2)
CO5: Distinguish between ethical and unethical practices (Apply – L3)

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
CO1						1	1	2							
CO2						2	1	2	1						
CO3						1	3	1	3						
CO4							3	1	2						
CO5						1	1	3	2						

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

TEXT BOOK/S:

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

REFERENCES:

1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**UNIT – 1**

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 and need of Value Education.	1	02/01/24		TLM1	CO1	T1	
2.	Basic guide lines, Content of Value Education	1	03/01/24		TLM1	CO1	T1	
3.	Process for Value Education	1	05/01/24		TLM1	CO1	T1	
4.	The process for self-exploration	1	06/01/24		TLM1	CO1	T1, R1	
5.	The process for self-exploration- NA,EV	1	08/01/24		TLM1	CO1	T1, R1	
6.	Continuous Happiness and Prosperity- A look at basic Human Aspirations	2	09/01/24 & 10/01/24		TLM1	CO1	T1, R1	
7.	Right understanding of Relationship and Physical Facility	1	12/01/24		TLM1	CO1	T1	
8.	Understanding Happiness and Prosperity	1	19/01/24		TLM1	CO1	T1	
No. of classes required to complete UNIT-I:		09	No. of classes taken:					

UNIT – 2

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
9.	Understanding human being	1	20/01/24		TLM1	CO2	T1	
10.	Understanding the needs & activities of Self ('I') and 'Body'	1	23/01/24		TLM1	CO2	T1	
11.	Understanding the Body as an instrument of Self	2	24/01/24 & 27/01/24		TLM1	CO2	T1	
12.	Understanding the characteristics and	2	30/01/24 & 31/01/24		TLM1	CO2	T1	

	activities of 'I' and harmony in 'I';							
13.	Understanding the harmony of I with the Body	1	02/02/24		TLM1	CO2	T1, R1	
14.	Indications of Body Health	1	03/02/24		TLM1	CO2	T1, R1	
15.	correct appraisal of Physical needs, meaning of Prosperity in detail	1	06/02/24		TLM1	CO2	T1, R1	
No. of classes required to complete UNIT-II:		09	No. of classes taken:					

UNIT - 3

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.	Understanding values in human-human relationship	1	07/02/24		TLM1	CO3	T1	
17.	meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness	3	09/02/24, 10/02/24 && 13/02/24		TLM1	CO3	T1	
18.	Trust and Respect as the foundational values of relationship	2	14/02/24 & 16/02/24		TLM1	CO3	T1	
19.	Respect in the relationship	1	17/02/24		TLM1	CO3	T1, R1	
20.	Respect in the relationship	1	20/02/24		TLM1	CO3	T1, R1	
21.	Revision		21/02/24 & 23/02/24					
22.	Other feelings in the relationship	1	24/02/24		TLM1	CO3	T1	
23.	Other feelings in the relationship	1	05/03/24		TLM1	CO3	T1	
24.	Reverence in the relationship	1	06/03/24		TLM1	CO3	T1	
25.	Justice in the relationship	1	09/03/24		TLM1	CO3	T1, R1	
No. of classes required to complete UNIT-III		12	No. of classes taken:					

UNIT - 4

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
26.	Understanding harmony in the Nature	1	12/03/24		TLM1	CO4	T1	
27.	Understanding existence as coexistence	2	13/03/24 & 15/03/24		TLM1	CO4	T1	
28.	Understanding existence as coexistence	1	16/03/24		TLM1	CO4	T1	
29.	Understanding existence as coexistence	2	19/03/24 & 20/03/24		TLM1	CO4	T1	

30.	Holistic perception of harmony at all levels of existence.	2	22/03/24 & 23/03/24		TLM1	CO4	T1	
No. of classes required to complete UNIT-IV		08	No. of classes taken:					

UNIT - 5

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.	Natural acceptance of human values;	2	26/03/24 & 27/03/24		TLM1	CO5	T2, R4	
32.	Definitiveness of Ethical Human Conduct	2	30/03/24 & 02/04/24		TLM1	CO5	T2, R4	
33.	Basis for Humanistic Education,	2	03/04/24 & 06/04/24		TLM1	CO5	T2, R4	
34.	Humanistic Constitution and Humanistic Universal Order;	2	10/04/24 & 12/04/24		TLM1	CO5	T2, R4	
35.	Competence in professional ethics,	1	13/04/24		TLM1	CO5	T2, R4	
36.	Strategy for transition from the present state to Universal Human Order	2	16/04/24 & 19/04/24		TLM1	CO5	T2, R4	
37.	Present state	1	20/04/24					
38.	Revision	2	23/04/24 & 24/04/24					
No. of classes required to complete UNIT-V		11 +3	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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
39.	Pollution-Human Role	1	26/04/24					
40.	Mutual-Enrichment	1	27/04/24					

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Descriptive Examination	1, 2	B1=15
I-Mid Online Quiz Examination	1, 2	C1 = 10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Descriptive Examination	3, 4, 5	B2=15
II-Mid Online Quiz Examination	3, 4, 5	C2 = 10
Evaluation of Assignment/Quiz Marks: $A = (A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Descriptive Marks: $B = 75\% \text{ of Max}(B1,B2) + 25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=15
Evaluation of Mid Online Quiz Marks: $C = \text{Average}(C1, C2)$	1,2,3,4,5	C=10
Cumulative Internal Examination : $A+B+C$	1,2,3,4,5	A+B+C=30
Semester End Examinations	1,2,3,4,5	D=70
Total Marks: $A+B+C+D$	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: Pursue higher education, entrepreneurship, and research to compete at global level.

PEO II: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO III: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO IV: Serve ever-changing needs of the society with a pragmatic perception.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

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.
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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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. USHA RANI	Dr.CH V NARAYANA		Dr. D Veeraiah
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 ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. L. Bhagya Lakshmi
Course Name & Code : Environmental Science & 20MC03
L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., CSE-C., IV-Sem., SEC-C A.Y : 2023-24

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management.

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).

TEXT BOOKS:

- T1** Anubha Kaushik, C.P.Kaushik, "Perspectives in Environmental Studies", New age international publishers, 5th Edition, Delhi, 2016.
- T2** Mahua Basu, S. Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 1st Edition, Delhi, 2016.

REFERENCE BOOKS:

- R1** S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.
- R2** R. Rajagopalan, "*Environmental Studies (From Crisis to Cure)*", Oxford University Press, 2nd Edition, New Delhi, 2012.
- R3** De, A.K, "Environmental Chemistry", New Age International (P) Limited, 5th Edition, New Delhi, 2003.
- R4** Dr.K.V.S.G. Murali Krishna, "Environmental Studies", VGS Techno Series, 1st Edition, Vijayawada, 2010.
- R5** G. Tyler Miller, Scott Spoolman, "Introduction to Environmental Studies", Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS**

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 of course and course objectives. Introduction of components of Environment	1	05-01-2024		2	
2.	Population explosion and variations among Nations.	1	08-01-2024		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	12-01-2024		2	
4.	Environmental Hazards	1	19-01-2024		2	
5.	Role of Information Technology in environmental management and human health.	1	22-01-2024		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

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 classification of Natural resources, Forest Resources,	1	29-01-2024		2	
2.	Water Resources	1	02-01-2024		2	
3.	Mineral Resources	1	05-02-2024		2	
4.	Food Resources	1	09-02-2024		2	
5.	Energy Resources	1	12-02-2024		2	
6.	Food Resources	1	16-02-2024		2	
No. of classes required to complete UNIT-II: 6				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

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.	Definition, structure and functions of an ecosystem	1	19-02-2024		2	
2.	Food chains and Food webs, Ecological succession, Ecological	1	23-02-2024		2	

	pyramids, Bio-geo-chemical cycles				
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Biogeographical classification of India. India as a mega diversity nation	1	22-02-2024		2
4.	I MID EXAMINATION	1	26-02-2024		
5.	I MID EXAMINATION	1	01-03-2024		
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	04-03-2024		2
7.	Man and wild life conflicts. Endangered and endemic species of India	1	11-03-2024		2,3
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	15-03-2024		2
No. of classes required to complete UNIT-III: 6				No. of classes taken:	

UNIT-IV : ENVIRONMENTAL POLLUTION

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.	Air Pollution	1	18-03-2024		2	
2.	Causes, effects and control measures of: Water Pollution	1	22-03-2024		2	
3.	Causes, effects and control measures of: Soil Pollution,	1	01-04-2024			
4.	Noise Pollution		08-04-2024			
5.	Solid Waste Management	1	12-04-2024		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	15-04-2024		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL 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
1.	Sustainable Development,	1	19-04-2024		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference, Green building	1	22-04-2024		2,3	
3.	Environmental Impact Assessment (EIA), Environmental Law	1	26-04-2024		2	
4.	II MID EXAMINATIONS	1	29-04-2024		2	
5.	II MID EXAMINATIONS	1	03-05-2024		2	
No. of classes required to complete UNIT-V: 03				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 (R17 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. L. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. G.V. Suresh
Course Name & Code : Data Mining using Python Lab (20CS58)
L-T-P Structure : 0-0-3
Credits : 1.5
Program / Sem / Sec : B.Tech., CSE., IV-Sem., Sec-C A.Y: 2023-24

PRE-REQUISITE : Python Programming.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this lab is to provide practical exposure on implementation of well-known data mining algorithms and Learning performance evaluation of data mining algorithms in a supervised and an unsupervised setting.

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

CO 1	Apply preprocessing techniques on real world datasets. (Apply-L3)
CO 2	Apply Apriori algorithm to generate frequent itemsets (Apply-L3)
CO 3	Apply Classification and clustering algorithms on different datasets (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	1	-	-	-	-	-	-	-	-	1	1	-	3
CO2	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO3	2	3	2	2	-	-	-	-	-	-	-	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	Data preprocessing tasks using python libraries - Loading, Dealing with Missing Data	3	04.01.24 11.01.24		TLM4	
2	Data preprocessing tasks using python libraries - Dealing with Categorical Data, Scaling data,	3	18.01.24		TLM4	

	Splitting data				
3	Similarity and Dissimilarity Measures using python	3	25.01.24 01.02.24		TLM4
4	Build a model using linear regression algorithm on any dataset.	3	08.02.24		TLM4
5	Build a classification model using Decision Tree algorithm on iris dataset	3	15.02.24		TLM4
6	Apply Naïve Bayes Classification algorithm on any dataset	3	22.02.24 29.02.24		TLM4
7	Generate frequent item sets using Apriori Algorithm in python	3	07.03.24		TLM4
8	Generate association rules for any market basket data.	3	14.03.24 21.03.24		TLM4
9	Apply K- Means clustering algorithm on any dataset.	3	28.03.23		TLM4
10	Apply Hierarchical Clustering algorithm on any dataset.	3	04.04.24 11.04.24		TLM4
11	Apply DBSCAN clustering algorithm on any dataset.	3	18.04.24		TLM4
12	Internal Examination	3	25.04.24		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.
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 systems, 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

	theprofessionalengineeringpractice
PO 7	Environmentandsustainability: Understandtheimpactoftheprofessionalengineeringsolutionsinsocietalandenvironmentalcontexts,anddemonstratetheknowledgeof,andneedforsustainabledevelopment.
PO 8	Ethics: Applyethicalprinciplesandcommittoprofessionaalethicsandresponsibilitiesandnormsof the engineering practice.
PO 9	Individualandteamwork: Functioneffectivelyasanindividual,andasamemberorleaderin diverseteams,andinmultidisciplinarysettings.
PO 10	Communication: Communicateeffectivelyoncomplexengineeringactivitieswiththeengineering community and with society at large, such as, being able tocomprehend and writeeffectivereportsanddesigndocumentation,makeeffectivepresentations,andgiveandreceive clearinstructions.
PO 11	Projectmanagementandfinance: Demonstrateknowledgeandunderstandingofthe engineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberandleaderin ateam,tomanageprojectsand inmultidisciplinaryenvironments.
PO 12	Life-longlearning: Recognizetheneedforandhavethepreparationandabilitytoengageindependent andlife-longlearningin thebroadestcontextoftechnological change.

PROGRAMMESPECIFICOUTCOMES(PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software projectdevelopmentusingopensourceprogrammingenvironmentforthesuccessoforganizati on.
PSO2	Theabilitytodesignanddevelopcomputerprogramsinnetworking,webapplicationsandIoT as per the society needs.
PSO3	Toinculcateanabilitytoanalyze,designandimplement databaseapplications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	G.V.Suresh	Dr. K. Naga Prasanthi	Dr. K. Naga Prasanthi	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. P Sarala

Course Name & Code :-OPERATING SYSTEMS Lab&20CS59

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

Credits:1.5

Program/Sem/Sec : B.Tech. - CSE/IV/C

A.Y.:2023-24

PREREQUISITE: Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this lab is to provide the various UNIX/Linux operating system commands, importance of System calls, Scheduling algorithms and Memory Management techniques.

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

CO1	Experiment with Unix commands and shell programming (Understand- L2)
CO2	Implement CPU scheduling algorithms and memory management Techniques(Apply- L3).
CO3	Simulate process synchronization and file system management using system calls(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	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
			1 - Low			2 -Medium			3 - High						

REFERENCE BOOKS:

R1	Silberschatz & Galvin, "Operating System Concepts", Wiley, 7th edition, 2007.
R2	William Stallings, "Operating Systems", PHI, 5th Edition, 2004.
R3	Operating Systems Design and Implementation 3rd Edition by Andrew Tanenbaum (Author), Albert Woodhull (Author)

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	02-1-24		DM5	
2.	Lab Cycle-1	3	09-1-24		DM5	
3.	Lab Cycle -1	3	23-1-24		DM5	
4.	Lab Cycle-2	3	30-1-24		DM5	
5.	Lab Cycle-2	3	06-2-24		DM5	
6.	Lab Cycle-2	3	13-2-24		DM5	
7.	Lab Cycle-3	3	20-2-24		DM5	
8.	Lab Cycle-3	3	05-3-24		DM5	
9.	Lab Cycle-4	3	12-3-24		DM5	
10.	Lab Cycle5	3	19-3-24		DM5	
11.	Lab Cycle6	3	26-3-24		DM5	
12.	Lab Cycle7	3	02-4-24		DM5	
13.	Lab Cycle-8	3	16-4-24		DM5	
14.	Internal exam	3	23-4-24		DM5	

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.
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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 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	Ms.P.SARALA	Dr.B. Siva Rama Krishna	Dr.D.VENKATA SUBBAIAH	Dr.D.VEERAI AH
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE [B Section]
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : SOFTWARE ENGINEERING LAB & 20IT55
L-T-P STRUCTURE : 0-0-3
COURSE CREDITS : 1.5
COURSE INSTRUCTOR : Dr. J. Nageswara Rao

Pre-requisites: Object Oriented Programming.

Course Educational Objectives (CEOs):

The main objective of this course is that a student will be familiar with principles behind the Object-Oriented Design and able to apply those principles in a project setting. Students will analyze applications and know how to take a pragmatic approach to software design and development.

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

- CO 1 Analyze Software Requirements for the given Real-World Application using Use Cases. (**Analyze-L4**)
- CO 2 Develop the UML Diagrams to view Software System in static aspects. (**Analyze-L4**)
- CO 3 Develop the UML Diagrams to view Software System in dynamic aspects. (**Analyze-L4**)
- CO 4 Improve individual / teamwork skills, communication & report writing skills with ethical values.

5. Course Articulation Matrix:

CO	Performance Indicator	PROGRAM OUTCOME(PO)												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	2	1	-	-	3
CO2	1.6.1,2.6.3,3.5.6,7.4.1,11.5.1	2	2	-	-	-	-	-	-	-	-	3	1	-	-	3
CO3	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	3
CO4	1.6.1,2.5.1,3.5.6,7.4.1,11.5.1	3	2	1	-	-	-	-	-	-	-	2	-	-	-	3

CO5	1.7.1,2.6.4,3.5.6,7.4.1,11.5.1	2	2	1	-	-	-	-	-	-	-	3	1	-	-	3
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Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'
1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High).

REFERENCE BOOK(S):

1. Roger S. Pressman, "Software engineering- A practitioner's Approach", TMH International Edition, 6th edition, 2005.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language UserGuide", Pearson Education, 2nd Edition, ISBN: 0-201-57168-4, 1998.
3. Meilir Page-Jones, "Fundamentals of Object-Oriented Design in UML", Pearson Education, 1st Edition, ISBN: 9788177586770, 8177586777, and 2007.
4. Robert B. Jackson, Stephen D. Burd, John W. Satzinger, "Object-Oriented Analysis and Design with the Unified Process", Cengage Learning, 1st Edition, ISBN: 9788131502693, 8131502694, 2007.
5. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", PHI, 3rd Edition, ISBN: 978- 0131489066, 2004.

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 UML Diagrams	3	04/01/24		DM5	
2.	Lab Cycle-1	3	11/01/24		DM5	
3.	Lab Cycle -2	6	18/01/24 25/01/24		DM5	
4.	Lab Cycle-3	6	01/02/24 08/02/24		DM5	
5.	Lab Cycle-4	3	15/02/24		DM5	
6.	Lab Cycle-5	3	22/02/24		DM5	
7.	Lab Cycle-6,7	6	07/03/24 14/03/24		DM5	
8.	Lab Cycle-8	3	21/03/24		DM5	
9.	Lab Cycle-9,10	3	28/03/24 04/04/24		DM5	
10.	Lab Cycle-11	3	18/04/24		DM5	
11.	Internal exam	3	25/04/24		DM5	

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.
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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.J.Nageswararao	Dr.J.Nageswararao	Dr. Y. Vijaya Bhasakar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : M.Kiran Kumar
Course Name & Code : Web Application Development using Full Stack - Module-II
 (Frontend Development) & 20CSS2
L-T-P Structure : 1-0-2 **Credits: 2**
Program/Sem/Sec : B.Tech. - CSE/IV/C **A.Y.: 2023-24**

PREREQUISITE: Object Oriented Programming and Data Base Management Systems

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this course is to learn the importance of client-server architecture in the web application development and able to develop dynamic data driven web applications by using advanced java technologies (Servlets, JSP, Struts2 and Hibernate framework).

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

CO1	Apply JDBC concepts to establish the communication between Java Applications and database . (Apply-L3)
CO2	Develop Static and Dynamic Web Applications by using Servlets and Java Server Pages (JSP). (Apply L3)
CO3	Develop Dynamic Data Driven Web Applications by using Struts2 and Hibernate frameworks . (Apply L3)
CO4	Improve individual/team work skills, communication & report writing skills with ethical values (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	-	-	2	-	2	-	-	-	-	-	-	-	-	1	3
CO2	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO3	-	-	2	-	2	-	-	-	-	-	-	-	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
	1 - Low			2 -Medium				3 - High							

REFERENCE BOOKS:

R1	Herbert Schildt, "Java: The complete reference", TMH Publications, 7th edition, 2006.
R2	Kathy Sierra & Bert Bates, "Head first Servlets and JSP: Passing the Sun Certified Web Component Developer Exam", O'Reilly Publications Second Edition.
R3	Budi Kurniawan, "Struts2 Design and Programming: A Tutorial", Brainy Software, 2nd Edition, 2008.
R4	Mahmoud Parsian, "JDBC Recipes: A Problem-Solution Approach", Apress.
R5	Madhusudhan Konda, "Just Hibernate, A Lightweight Introduction to the Hibernate Framework", O'Reilly Media.
R6	Chuck Cavaness, "Programming Jakarta Struts", O'Reilly Media, 2nd Edition.

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.	LabCycle-1	4	05-01-24		DM5	
2.	LabCycle-2	4	12-01-24		DM5	
3.	LabCycle-3	4	19-01-24		DM5	
4.	LabCycle-4	4	02-02-24		DM5	
5.	Project Design Phase	4	09-02-24		DM4	
6.	LabCycle-5	4	16-02-24		DM5	
7.	LabCycle-6	4	23-02-24		DM5	
8.	LabCycle-6	4	15-03-24		DM4	
9.	Project Backend Connectivity	4	22-03-24		DM5	
10.	LabCycle-7	4	12-04-24		DM5	
11.	LabCycle-8	4	19-04-24		DM4	
12.	Project Execution	4	26-04-24		DM5	

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 Regulation):

Evaluation Task	Marks
Report	10
Quality of work	10
Presentation	20
Interaction / Queries	10
Total	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	M. Kiran Kumar	Dr.S.Nagarjuna Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				