



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, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

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

Credits : 3
A.Y: 2021-22

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. (Understand L2)
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	07.03.2022		TLM1	
2.	Algorithm definition and Specifications	1	09.03.2022		TLM1	
3.	Performance Analysis	1	10.03.2022		TLM1	
4.	Time Complexity and space complexity	1	12.03.2022		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	14.03.2022		TLM1	
6.	Divide & Conquer Technique: General Method	1	16.03.2022		TLM1	
7.	Binary Search and its analysis	1	17.03.2022		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	19.03.2022		TLM1	
9.	Merge sort and its Analysis	1	21.03.2022		TLM1	
10.	Quick Sort algorithm and its analysis	1	23.03.2022		TLM1	
11.	Closest pair of points	1	24.03.2022		TLM1	
12.	Tutorial - 1	1	26.03.2022		TLM3	
No. of classes required to complete UNIT-I		12		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	28.03.2022		TLM1	
15.	Knapsack problem, Example problem	2	30.03.2022 & 31.03.2022		TLM1	
16.	Job sequencing with deadlines, Example problem	1	04.04.2022		TLM1	
17.	Minimum cost spanning trees, example problem	2	06.04.2022 & 07.04.2022		TLM1	

18.	Optimal storage on tapes, Example problem	1	09.04.2022		TLM1	
19.	Single source shortest path problem	1	11.04.2022		TLM1	
20.	Huffman coding	1	13.04.2022		TLM1	
21.	Tutorial – II / Quiz - II	1	16.04.2022		TLM3	
No. of classes required to complete UNIT-II		10		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	18.04.2022		TLM1	
23.	Multistage Graph, Example problem	2	20.04.2022 & 21.04.2022		TLM1	
24.	All pairs shortest path, Example problem	2	23.04.2022 & 25.04.2022		TLM1	
25.	Optimal Binary Search Tree, Example problem	2	02.05.2022 & 04.05.2022		TLM1	
26.	0/1 Knapsack Problem	1	05.05.2022		TLM1	
27.	Travelling Salesperson Problem	2	07.05.2022 & 09.05.2022		TLM1	
28.	Single source shortest path problem, Example Problem	1	11.05.2022		TLM1	
29.	Reliability design, Example Problem	2	12.05.2022 & 14.05.2022		TLM1	
30.	Tutorial – III / Quiz - III	1	16.05.2022		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	18.05.2022		TLM1	
32.	The 8-Queens problem	2	19.05.2022 & 21.05.2022		TLM1	
33.	Sum of subsets problem	2	23.05.2022 & 25.05.2022		TLM1	

34.	Graph coloring problem	1	26.05.2022		TLM1	
35.	Hamiltonian cycles	1	28.05.2022 & 30.05.2022		TLM1	
36.	Tutorial – IV / Quiz - IV	1	01.06.2022		TLM3	
No. of classes required to complete UNIT-IV		07			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	02.06.2022		TLM1	
44.	LC Branch and bound solution for Travelling Salesperson Problem	2	04.06.2022 & 06.06.2022		TLM2	
45.	LC Branch and bound solution 0/1 Knapsack problem	1	08.06.2022		TLM2	
46.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	09.06.2022 & 11.06.2022		TLM2	
47.	FIFO Branch and bound solution 0/1 Knapsack problem	1	13.06.2022		TLM2	
48.	LIFO Branch and Bound	1	15.06.2022		TLM2	
49.	Tutorial – V / Quiz - V	1	16.06.2022		TLM3	
50.	Discussion about SEE paper	1	18.06.2022		TLM3	
No. of classes required to complete UNIT-V		10			No of classes taken	

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Convex hull	1	18.06.2022		TLM2	

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 (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
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.

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. Sitharam

Course Coordinator
Dr. M. Sitharam

Module Coordinator
Dr.D V Subbaiah

HOD
Dr.D.Veeraiah



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.

hodcse@lbrce.ac.in, csehbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S Jayaprada

Course Name & Code : Data Warehousing and Data mining & 20CS10

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

Credits: 3

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

A.Y.: 2021-22

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

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 over fitting. (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 data set. (Apply - L3)

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

COs	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO2	PSO3
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 to Course and COs	1	07.03.2022		TLM1,2	
2.	Introduction to Unit-I	1	09.03.2022		TLM1,2	
3.	Data Warehouse and OLAP Technology: An Overview: Data Warehouse	1	11.03.2022		TLM1,2	
4.	Data Warehouse and OLAP Technology: Multidimensional Data Model	1	14.03.2022		TLM1,2	
5.	Data Warehouse and OLAP Technology: Data Warehouse Architecture	1	16.03.2022		TLM1,2	
6.	Data Warehouse and OLAP Technology: Data Warehouse Implementation	1	18.03.2022		TLM1,2	
7.	Data Warehouse and OLAP Technology: From Data Warehousing to Data Mining.	1	19.03.2022		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	21.03.2022		TLM1,2	
2.	Motivating challenges, The origins of Data Mining,	1	23.03.2022		TLM1,2	
3.	Data Mining Tasks, Types of Data, Data Quality.	1	25.03.2022		TLM1,2	
4.	Data Preprocessing: Aggregation	1	26.03.2022		TLM1,2	
5.	Data Preprocessing: Sampling, Dimensionality Reduction, Feature Subset Selection	1	28.03.2022		TLM1,2	
6.	Data Preprocessing: Feature creation	1	30.03.2022		TLM1,2	
7.	Data Preprocessing: Discretization and Binarization	1	01.04.2022		TLM1,2	
8.	Data Preprocessing: Variable Transformation	1	04.04.2022		TLM1,2	
9.	Data Preprocessing: Measures of Similarity and Dissimilarity	1	06.04.2022		TLM1,2	
No. of classes required to complete UNIT-II: 09				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	08.04.2022		TLM1,2	
2.	Decision Tree Induction: Working of Decision Tree, building a decision tree	1	09.04.2022		TLM1,2	
3.	methods for expressing an attribute test conditions, measures for selecting the best split	1	11.04.2022		TLM1,2	
4.	Algorithm for decision tree induction.	1	13.04.2022		TLM1,2	
5.	Model Overfitting: Due to presence of noise, due to lack of representation samples,	1	16.04.2022		TLM1,2	
6.	Evaluating the performance of classifier: holdout method, random sub sampling, cross-validation, bootstrap.	2	22.04.2022		TLM1,2	
7.	Bayes Theorem	2	27.04.2022		TLM1,2	
8.	Naïve Bayes Classifier	2	30.04.2022		TLM1,2	
No. of classes required to complete UNIT-III: 11				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	1	02.05.2022		TLM1,2	
2.	Algorithms: Problem Definition, Frequent Item Set Generation	2	04.05.2022		TLM1,2	
3.	Apriori Principle, Apriori Algorithm	2	09.05.2022		TLM1,2	
4.	Rule Generation, Compact Representation of Frequent Itemsets	2	11.05.2022		TLM1,2	
5.	FPGrowth Algorithm	2	14.05.2022		TLM1,2	
No. of classes required to complete UNIT-IV: 09				No. of classes taken:		

UNIT-V: Memory System Design, Peripheral Devices and their characteristics

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	16.05.2022		TLM1,2	
2.	Different Types of Clustering, Different Types of Clusters;	1	18.05.2022		TLM1,2	

3.	K-means: The Basic K-means Algorithm	1	20.05.2022		TLM1,2
4.	K-means Additional Issues, Bisecting K-means, Strengths and Weaknesses;	1	23.05.2022		TLM1,2
5.	Exercise problems on K-means	1	27.05.2022		TLM1,2
6.	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm	1	01.06.2022		TLM1,2
7.	Exercise problems on Agglomerative Hierarchical Clustering Algorithm	1	03.06.2022		TLM1,2
8.	DBSCAN: Traditional Density Center-Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.	1	06.06.2022		TLM1,2
9.	Exercise problems on DBSCAN Algorithm	1	10.06.2022		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	10.06.2022		TLM1,2	
2.	Regression Analysis - II (Logistic Regression)	1	13.06.2022		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

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.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S Jayaprada	Dr. S Jayaprada	Dr Y Vijaya 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, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor:Dr.KDeviPriya

Course Name & Code : Operating Systems -20CS11

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

Credits:3

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

A.Y.:2021-22

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,firstEdition,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	7-3-2022		TLM1/TLM2	
2.	Introduction to Operating systems	1	8-3-2022		TLM1/TLM2	
3.	Introduction to Operating systems	1	9-3-2022		TLM1/TLM2	
4.	Introduction to Operating systems	1	12-3-2022		TLM1/TLM2	
5.	Operating system services and user operating system interfaces	1	14-3-2022		TLM1/TLM2	
6.	System calls and types of system calls	1	15-3-2022		TLM1/TLM2	
7.	System programs, OS design and implementation	1	16-3-2022		TLM1/TLM2	
8.	OS structure-Types	1	19-3-2022			
9.	Virtual Machine	1	21-3-2022		TLM2	
10.	OS generation and System Boot	1	22-3-2022		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
11.	Concepts and process scheduling	1	23-3-2022		TLM1/TLM2	
12.	Operations on process	1	26-3-2022		TLM2	
13.	IPC and examples on IPC	1	28-3-2022		TLM2	
14.	Communication in client server systems	1	29-3-2022		TLM2	
15.	Treads overview, Multithreading Models,	1	30-3-2022		TLM2	
16.	Thread libraries and Thread issues	1	4-4-2022		TLM2	
17.	Scheduling Criteria	1	6-4-2022		TLM2	
18.	Scheduling algorithms	1	9-4-2022		TLM2	
19.	Scheduling algorithms	1	11-4-2022		TLM2	
20.	Multi-Processor Scheduling	1	12-4-2022		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
21.	The Critical section problem, Peterson's solutions	1	13-4-2022		TLM1/TLM2	

22.	Synchronization hardware		16-4-2022		TLM1/ TLM2
23.	Semaphores, Classic problems of Synchronization	1	18-4-2022		TLM1/ TLM2
24.	Monitors, Synchronization examples	1	19-4-2022		TLM1/ TLM2
25.	atomic transactions	1	20-4-2022		TLM1
26.	System model and deadlock characterization	1	2-5-2022		TLM1
27.	Methods for Handling deadlocks and deadlock prevention	1	4-5-2022		TLM1
28.	Deadlock Avoidance	1	7-5-2022		TLM1
29.	Deadlock detection	1	9-5-2022		TLM1
30.	Recovery from deadlock	1	10-5-2022		TLM1
No. of classes required to complete UNIT-III: 10					

UNIT-IV: Memory mangement

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	Swapping	1	11-5-2022		TLM1	
32.	Contiguous Memory Allocation	1	14-5-2022		TLM1	
33.	Paging and structure of a page table	1	16-5-2022		TLM1	
34.	Segmentation	1	17-5-2022		TLM1	
35.	Demand paging	1	18-5-2022		TLM1	
36.	Page replacement	1	21-5-2022		TLM1	
37.	Allocation of frames	1	23-5-2022		TLM1	
38.	Thrashing	1	24-5-2022		TLM1	
39.	Memory mapped files	1	25-5-2022		TLM1	
40.	Allocating kernel memory	1	28-5-2022		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
41.	Overview of Mass storage structure	1	30-5-2022		TLM2	
42.	Disk structure	1	31-5-2022		TLM2	
43.	Disk Attachment	1	1-6-2022		TLM2	
44.	Disk Scheduling	1	4-6-2022		TLM2	
45.	Disk Management	1	6-6-2022		TLM2	
46.	The Concept of a file and access methods	1	7-6-2022		TLM2	
47.	File System structure	1	8-6-2022		TLM2	

48.	File system implementation	1	116-2022		TLM2
49.	Directory implementation	1	13-6-2022		TLM2
50.	Allocation methods	1	14-6-2022		TLM2
51.	Free space management	1	15-6-2022		TLM5
52.	Efficiency and performance, recovery	1	18-6-2022		TLM1/TLM2/TLM5
No. of classes required to complete UNIT-V: 12				No. of classes taken:	

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

PART-C

EVALUATION PROCESS (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

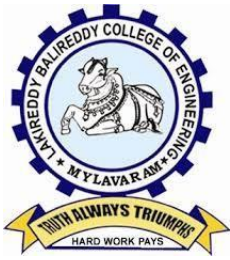
PROGRAMME OUTCOMES (POs):

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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	DR.K DEVIPRIYA	Dr. K DEVIPRIYA	Dr.D.VENKATA SUBBAIAH	Dr.V.VEERAAIAH
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC 'A' Grade & NBA (Under Tier - D), ISO 9001:2015 Certified
Institution Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, N.T.R DIST., A.P.-521 230.

hodcse@lbrce.ac.in, tselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem, CSE
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: M.SWATHI
COURSE COORDINATOR	: CH. SRINIVASA 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 Understand the fundamentals of software engineering concepts and software process models. **(Understand-L2)**
- CO 2 Apply the requirement elicitation techniques for preparing SRS and design engineering. **(Apply-L3)**
- CO 3 Understanding 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-PO-PSO mapping

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).

TEXTBOOKS:

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 Modelling Language User Guide”, PEARSON ,4th Impression, 2012.

REFERENCE BOOKS:

1. Software Engineering - Concepts and practices: Ugrasen Suman, Cengage learning
2. Object-oriented analysis and design using UML”, Mahesh P. Matha, PHI
3. Fundamentals of Software Engineering, Rajib Mall, Third Edition ,PHI
4. https://onlinecourses.nptel.ac.in/noc20_cs68 [1,2,3,4,5]

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**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
13.	Introduction to Software Engineering & Evolving role of Software	1	07/03/22		TLM2	CO1	T1	
14.	Software Definition and Characteristics & Changing nature of Software	1	10/03/22		TLM2	CO1	T1	
15.	Legacy Software & Imp of S/W Engg	1	12/03/22		TLM2	CO1	T1	
16.	Software Myths	1	14/03/22		TLM2	CO1	T1	
17.	S/W Process Models: Layered technology	1	17/03/22		TLM2	CO1	T1,R1	
18.	Process Framework – Generic Framework Activities & Umbrella Activities	1	19/03/22		TLM2	CO1	T1,R1	
19.	Software Process Models	1	21/03/22		TLM2	CO1	T1,R1	
20.	Waterfall Model	1	24/03/22		TLM2	CO1	T1,R1	
21.	Incremental Model	1	26/03/22		TLM2	CO1	T1	
22.	Spiral & V Model	1	28/03/22		TLM2	CO1	T1	
23.	Component based s/w Development & Unified Model	1	31/03/22		TLM2	CO1	T1	
24.	ASSIGNMENT-1				TLM3	CO1	T1	

No. of classes required to complete UNIT-I	11			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
25.	Requirements analysis &S/W design: Requirements gathering & Analysis	2	02/04/22 04/04/22		TLM2	CO2	T1	
26.	Software Requirements Specification (SRS)	1	07/04/22		TLM2	CO2	T1	
27.	Design Engineering: Overview of design process	1	09/04/22		TLM2	CO2	T1	
28.	Design Concepts	1	11/04/22		TLM2	CO2	T1	
29.	Architectural Concepts	1	16/04/22		TLM2		T1	
30.	ASSIGNMENT-2				TLM3	CO2	T1	
No. of classes required to complete UNIT-2		6			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
31.	Building Blocks of UML	1	18/04/22		TLM2	CO3	T1	
32.	Defining Things	1	21/04/22		TLM2	CO3	T1	
33.	Relationships &Diagrams	1	23/04/22		TLM2	CO3	T1	
34.	Common mechanism in UML	1	02/05/22		TLM2	CO3	T1,R1	
35.	Class & Object diagrams	1	05/05/22		TLM2	CO3	T1,R1	
36.	ASSIGNMENT-3				TLM3	CO3	T1	
No. of classes required to complete UNIT-3		5			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
37.	Behavioral Modelling: Interactions	1	07/05/22		TLM2	CO4	T1	
38.	Interaction diagrams	1	09/05/22		TLM2	CO4	T1	
39.	Use cases, Use case diagrams	1	12/05/22		TLM2	CO4	T1	
40.	Activity diagrams	1	14/05/22		TLM2	CO4	T1,R1	
41.	Events & Signals	1	16/05/22		TLM2	CO4	T1,R1	
42.	State Machines	1	19/05/22		TLM2	CO4	T1	
43.	Processes & Threads	1	21/05/22		TLM2	CO4	T1	
44.	Time &Space	1	23/05/22		TLM2	CO4	T1	
45.	State Chart diagrams	1	26/05/22		TLM2	CO4	T1	
46.	Architectural Modeling: Component, Deployment	1	28/05/22		TLM2	CO4	T1	
47.	Component, Deployment diagrams	1	30/05/22		TLM2	CO4	T1	
48.	ASSIGNMENT-4				TLM3	CO4	T1,R1	
No. of classes required to complete UNIT-4		11			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
49.	Testing techniques: Software Testing Fundamentals	1	02/06/22 04/06/22		TLM2	CO5	T1	
50.	Unit testing	1	06/06/22		TLM2	CO5	T1	
51.	Integration Testing	1	09/06/22		TLM2	CO5	T1,R1,R2	
52.	Black Box Testing	1	11/06/22		TLM2	CO5	T1,R1,R2	
53.	White Box Testing	1	13/06/22		TLM2	CO5	T1	

54.	Debugging	1	16/06/22		TLM2	CO5	T1	
55.	System Testing	1	18/06/22		TLM2	CO5	T1,R1,R2	
56.	ASSIGNMENT-5				TLM3	CO5	T1,R1,R2	
No. of classes required to complete UNIT-5		7			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	Marks
Assignment– 1 (Units I,II&III(Half of the Syllabus))	A1=5
I-Descriptive Examination (Units I, II&III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units I, II&III (Half of the Syllabus))	Q1=10
Assignment– 2 (Units III (remaining Half of the Syllabus),IV&V))	A2=5
II- Descriptive Examination (Units III (remaining Half of the Syllabus), IV&V))	M2=15
II-Quiz Examination (Units III (remaining Half of the Syllabus), IV&V))	Q2=10
Mid Marks=80% of Max((M1+A1+Q1),(M2+A2+Q2))+ 20% of Min((M1+A1+Q1),(M2+A2+Q2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE):	70
Total Marks=CIE+SEE	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):

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.Swathi	Mr.Ch.Srinivasa Rao	Dr.CH.V.Narayana	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 & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. D.VENKATA SUBBIAH

Course Name & Code : Universal Human Values 2: Understanding Harmony (20HS01)

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

Credits : 3

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

A.Y. : 2021-22

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): 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 the course, student will be able to

CO1	Apply the value inputs in life and profession
CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the self and the Body
CO3	Understand the role of a human being in ensuring harmony in society
CO4	Understand the role of a human being in ensuring harmony in the nature and existence
CO5	Distinguish between ethical and unethical practices

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

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

TEXTBOOKS:

- T1** R R Gaur, r singal, G P Bagaria, "Human values and Professional Ethics", Excel Books, New Delhi,2010

REFERENCE BOOKS:

- R1** Jeevan vidya: Ek Parichaya, A.Nagaraj, Jeevan Vidya Prakashan, Amarkantak,1999
R2 Human values, A N Tripathi, New Age Publishers, New Delhi, 2004
R3 The story of my experiments with Truth, Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Need, Basic Guide lines, content and Process for value Education

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, COs	1	10-3-2022		TLM2	
2.	Process for self exploration: Natural Acceptance	1	11-3-2022		TLM.2	
3.	Experiential validation, Continuous Happiness and prosperity	1	17-3-2022		TLM2	
4.	A look at basic human aspirations: Right understanding	1	19-3-2022		TLM2	
5.	Relationship , Physical facility	1	24-3-2022		TLM2	
6.	Understanding Happiness and prosperity	1	25-3-2022		TLM2	

7.	Understanding Happiness and prosperity	1	26-4-2022		TLM2	
No. of classes required to complete UNIT-I: 7				No. of classes taken:7		

UNIT-II: Understanding Harmony in the Human Being-Harmony in myself

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Understanding Human being as a co-existence of sentient 'I' and the material 'Body'	1	31-4-2022		TLM2	
9.	Understanding the needs of self ('I') and 'Body' - Happiness and Physical facility	1	1-4-2022		TLM2	
10.	Understanding the Body as an instrument of 'I'	1	7-4-2022		TLM2	
11.	Understanding the characteristics and activities of 'I' and harmony in 'I'	1	08-4-2022		TLM2	
12.	Understanding the harmony of I with the Body, Sanyam and Health	1	09-4-2022		TLM2	
13.	Correct appraisal of Physical needs	1	16-4-2022		TLM2	
14.	Meaning of prosperity in detail	1	21-4-2022		TLM1	
No. of classes required to complete UNIT-II: 7				No. of classes taken:7		

UNIT-III: Understanding Harmony in the Family and society-Harmony in Human- Human Relationship

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Understanding values in human-human relationship: meaning of justice	1	22-4-2022		TLM2	
16.	Program for fulfillment to ensure mutual happiness, Trust and Respect as the foundational values of relationship	1	23-4-2022		TLM2	
17.	I-Mid examinations		25-4-2022 to 30-4-2022			
18.	Understanding Harmony in the society: Resolution	1	05-5-2022		TLM2	
19.	Prosperity, fearlessness and co-existence as comprehensive human	2	6-5-2022 7-5-2022		TLM2	

	goals					
20.	Visualizing a universal harmonious order in the society- undivided society	1	12-5-2022		TLM2	
21.	Universal order-from family to world family	1	13-5-2022		TLM2	
22.	Gratitude as a universal value in relationships	1	14-5-2022		TLM2	
No. of classes required to complete UNIT-III: 8					No. of classes taken:	

UNIT-IV: Understanding Harmony in the Nature and Existence- Whole existence as Coexistence

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Understanding Harmony in the Nature	1	19-5-2022		TLM2	
24.	Interconnectedness and mutual fulfillment among four orders of nature	1	20-5-2022		TLM2	
25.	Recyclability and self regulation in nature	1	21-5-2022		TLM2	
26.	Understanding Existence as co-existence of mutually interacting units in all pervasive space	1	26-5-2022		TLM2	
27.	Understanding Existence as co-existence of mutually interacting units in all pervasive space	1	27-5-2022		TLM2	
28.	Holistic perception of harmony at all levels of existence	1	28-5-2022		TLM2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V: Implications of the above Holistic understanding of Harmony on professional ethics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	Natural acceptance of human values	1	02-5-2022		TLM2	
30.	Definitiveness of ethical human conduct	1	03-5-2022		TLM2	
31.	Basis for humanistic education	1	04-6-2022		TLM2	
32.	Humanistic constitution and humanistic universal order	1	9-6-2022		TLM2	
33.	Competence in professional ethics	1	10-6-2022		TLM2	
34.	Strategy for transition from the present state to universal human order	1	11-6-2022		TLM2	
35.	Revision	3	16-6-2022 17-6-2022 18-6-2022		TLM2	
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

Teaching Learning Methods			
TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)

TLM3	Tutorial	TLM6	Group Discussion/Project
-------------	----------	-------------	--------------------------

PART-C

EVALUATION PROCESS (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 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.

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. D.VENKATA SUBBAIH	Dr. CH.V.NARAYANA	Dr. CH.V.NARAYANA	Dr. D.VEERAI AH
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 ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. V. 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	: 2021-22

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	07-03-2022		2	
2.	Population explosion and variations among Nations.	1	11-03-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	14-03-2022		2	
4.	Environmental Hazards	1	21-03-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	25-03-2022		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	28-03-2022		2	
2.	Water Resources	1	01-04-2022		2	
3.	Mineral Resources	1	04-04-2022		2	
4.	Food Resources	1	08-04-2022		2	
5.	Food Resources	1	11-04-2022		2	
6.	Mineral Resources	1	18-04-2022		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	22-04-2022		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	22-04-2022		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of India. India as a mega diversity	1	22-04-2022		2	

	nation					
4.	I MID EXAMINATION		25-04-2022			
5.	I MID EXAMINATION		29-04-2022			
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	02-05-2022		2	
7.	Man and wild life conflicts. Endangered and endemic species of India	1	06-05-2022		2,3	
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	09-05-2022		2	
No. of classes required to complete UNIT-III: 8				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	13-05-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	16-05-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		20-05-2022			
4.	Noise Pollution		23-05-2022			
5.	Solid Waste Management	1	27-05-2022		2,3	
6.	Solid Waste Management	1	30-05-2022		2	
7.	CASE STUDIES	1	03-06-2022			
8.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	06-06-2022			
No. of classes required to complete UNIT-IV: 8				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	10-06-2022		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	13-06-2022		2,3	
3.	Environmental Impact Assessment (EIA), Green building, Environmental Law	1	17-06-2022		2	
4.	II MID EXAMINATIONS	1	20-06-2022			
5.	II MID EXAMINATIONS	1	24-06-2022			
6.	II MID EXAMINATIONS	1	27-06-2022			
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- DescriptiveExamination (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 $\text{Max}((M1+Q1+A1), (M2+Q2+A2))$ +20% of $\text{Min}((M1+Q1+A1), (M2+Q2+A2))$	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. V. 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

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

hodcse@lbrce.ac.in, cse1breddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr S Jayaprada
 Course Name & Code : DataMining using PythonLab(20CS58)
 L-T-P Structure : 0-0-3 Credits: 1.5
 Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sec-A A.Y: 2021-22

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	16.03.22		TLM4	
2	Data preprocessing tasks using python libraries – Dealing with Categorical Data, Scaling data,	3	23.03.22		TLM4	

	Splitting data				
3	Similarity and Dissimilarity Measures using python	3	30.04.22		TLM4
4	Build a model using linear regression algorithm on any dataset.	3	06.04.22		TLM4
5	Build a classification model using Decision Tree algorithm on iris dataset	3	13.04.22		TLM4
6	Apply Naïve Bayes Classification algorithm on any dataset	3	20.04.22		TLM4
7	Generate frequent item sets using Apriori Algorithm in python	3	04.05.22		TLM4
8	Generate association rules for any market basket data.	3	11.05.22		TLM4
9	Apply K- Means clustering algorithm on any dataset.	3	18.05.22		TLM4
10	Apply Hierarchical Clustering algorithm on any dataset.	3	02.06.22		TLM4
11	Apply DBSCAN clustering algorithm on any dataset.	3	09.06.22		TLM4
12	Internal Examination	3	16.06.22		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):

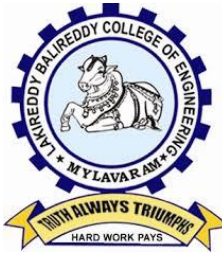
PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching 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	Dr.S.Jayaprada	Dr.S.Jayaprada	Dr.Y.Vijay 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: Dr. K DEVI PRIYA

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.: 2022-23

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

C01	Experiment with Unix commands and shell programming (Understand- L2)
C02	Implement CPU scheduling algorithms and memory management Techniques (Apply- L3).
C03	Simulate process synchronization and file system management using system calls (Apply -L3).
C04	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
C01	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C03	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C04	-	-	-	-	-	-	-	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.

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	10-3-22		DM5	
2.	Lab Cycle-1	3	17-3-22		DM5	
3.	Lab Cycle -1	3	24-3-22		DM5	
4.	Lab Cycle-2	3	31-3-22		DM5	
5.	Lab Cycle-2	3	7-4-22		DM5	
6.	Lab Cycle-2	3	21-4-22		DM5	
7.	Lab Cycle-3	3	28-4-22		DM5	
8.	Lab Cycle-3	3	5-5-22		DM5	
9.	Lab Cycle-4	3	12-5-22		DM5	
10.	Lab Cycle5	3	19-5-22		DM5	
11.	Lab Cycle6	3	26-5-22		DM5	
12.	Lab Cycle 6	3	16-6-22		DM5	
13.	Lab Cycle7	3	2-6-22			
14.	Lab Cycle-8	3	9-6-22			
15.	Internal exam	3	16-6-22			

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

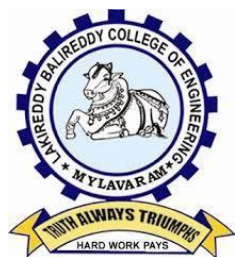
PROGRAMME OUTCOMES (POs):

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. K DeviPriya)	(Dr. K. Devi Priya)	(Dr. Y.V.B. Reddy)	(Dr. D. Veeraiah)
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC '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, N.T.R DIST., A.P.-521 230.

hodcse@lbrce.ac.in, tselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem., CSE
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING LAB & 20IT55
L-T-P STRUCTURE	: 0-0-3
COURSE CREDITS	: 1.5
COURSE INSTRUCTOR	: M.Swathi

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.

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	1.1.1, 2.2.3, 3.4.1, 12.2.1	2	2	1									1	1		3
CO2	1.1.1, 2.4.2, 2.4.3, 4.3.2, 4.1.3	3	2		2									2		
CO3	1.1.1, 2.1.2, 2.2.3, 2.2.4, 3.1.5, 4.1.2, 4.1.4, 12.1.2	2	3	2	2								2		2	2
CO3	2.4.2, 2.4.3, 4.1.2, 4.1.4		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).

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	11/03/2022		DM5	
2.	Lab Cycle-1	3	25/03/2022		DM5	
3.	Lab Cycle -2	3	01/04/2022		DM5	
4.	Lab Cycle-3	3	08/04/2022		DM5	
5.	Lab Cycle-4	3	22/04/2022		DM5	
6.	Lab Cycle-5	3	06/05/2022		DM5	
7.	Lab Cycle-6	3	13/05/2022		DM5	
8.	Lab Cycle-7	3	20/05/2022		DM5	
9.	Lab Cycle-8	3	27/05/2022		DM5	
10.	Lab Cycle-9	3	03/05/2022		DM5	
11.	Lab Cycle-10 & 11	3	10/06/2022		DM5	
12.	Internal exam	3	17/06/2022			

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	M.Swathi	Mr.Ch.Srinivasa Rao	Dr.CH.V.Narayana	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, NTR DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SrinivasaRao

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/A

A.Y.: 2021-22

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 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, "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, 2nd Edition.
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.	Lab Cycle-1	3	08-03-2022		DM5	
2.	Lab Cycle-1	3	15-03-2022		DM5	
3.	Lab Cycle-2	3	22-03-2022		DM5	
4.	Lab Cycle-2	3	29-03-2022		DM5	
5.	Lab Cycle-3	3	05-04-2022		DM5	
6.	Lab Cycle-3	3	12-04-2022		DM5	
7.	Lab Cycle-4	3	19-04-2022		DM5	
8.	Lab Cycle-5	3	10-05-2022		DM5	
9.	Lab Cycle-6	3	17-05-2022		DM5	
10.	Lab Cycle-6	3	24-05-2022		DM5	
11.	Lab Cycle-7	3	31-05-2022		DM5	
12.	Lab Cycle-7	3	07-06-2022		DM5	
13.	Lab Cycle-8	3	14-06-2022		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	(Mr. N. SrinivasaRao)	(Ms. K. Devi Priya)	(Dr. Y.V.B. Reddy)	(Dr. D. Veeraiah)
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & 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.

<http://cse.lbrce.ac.in>, cse.lbrce@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.S.NAGARJUNA REDDY
Course Name & Code : DAA (20CS06)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech, IV-Sem.,B A.Y: 2021-22

PRE-REQUISITE: Data structures.

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. (Understand-L2)
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	2	-	-	-	-	-	-	-	-	-	3		
CO2	2	3	1	-	-	-	-	-	-	-	-	-	3		
CO3	2	3	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	07.03.2022		TLM1	
2.	Algorithm definition and Specifications	1	09.03.2022		TLM1	
3.	Performance Analysis	1	11.03.2022		TLM1	
4.	Time Complexity and space complexity	1	14.03.2022		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	16.03.2022		TLM1	
6.	Divide & Conquer Technique: General Method	1	19.03.2022		TLM1	
7.	Binary Search and its analysis	1	21.03.2022		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	23.03.2022		TLM1	
9.	Merge sort and its Analysis	1	25.03.2022		TLM1	
10.	Quick Sort algorithm and its analysis	1	26.03.2022		TLM1	
11.	Closest pair of points	1	28.03.2022		TLM1	
No. of classes required to complete UNIT-I		11		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
12	Greedy Method – Introduction, General method	1	30.03.2022		TLM1	
13.	Knapsack problem, Example problem	2	01.04.2022 & 04.04.2022		TLM1	
14.	Job sequencing with deadlines, Example problem	1	06.04.2022		TLM1	
15.	Minimum cost spanning trees, example problem	2	08.04.2022 & 09.04.2022		TLM1	

16.	Optimal storage on tapes, Example problem	1	11.04.2022		TLM1	
17.	Single source shortest path problem	2	13.04.2022 & 16.04.2022		TLM1	
18.	Huffman coding	1	18.04.2022		TLM1	
No. of classes required to complete UNIT-II		10		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
19	Dynamic Programming- General method	1	20.04.2022		TLM1	
20.	Multistage Graph, Example problem	2	22.04.2022 & 23.04.2022		TLM1	
21.	All pairshortest path, Example problem	2	02.05.2022 & 04.05.2022		TLM1	
22	Optimal Binary Search Tree, Example problem	2	06.05.2022 07.05.2022		TLM1	
23	0/1 Knapsack Problem	2	09.05.2022 11.05.2022		TLM1	
24	Travelling Salesperson Problem	2	13.05.2022 14.05.2022		TLM1	
25.	Single source shortest path problem, Example Problem	1	16.05.2022		TLM1	
26.	Reliability design, Example Problem	2	18.05.2022 20.05.2022		TLM1	
No. of classes required to complete UNIT-III		14		No of classes taken		

NIT-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
27	General Method	1	22.05.2022		TLM1	
28	The 8-Queens problem	1	23.05.2022		TLM1	
29.	Sum of subsets problem	2	25.05.2022 27.05.2022		TLM1	
30	Graph coloring problem	1	28.05.2022		TLM1	
31	Hamiltonian cycles	1	30.05.2022		TLM1	
No. of classes required to complete UNIT-IV		07		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
32	Introduction	1	01.06.2022			
33.	Branch and Bound-job sequencing with deadlines	2	03.06.2022 04.06.2022		TLM1	
34	LC Branch and bound solution 0/1 Knapsack problem	2	06.06.2022 08.06.2022		TLM2	
35	FIFO Branch and bound solution 0/1 Knapsack problem	2	10.06.2022 11.06.2022		TLM2	
36	Traveling Sales Person Problem	2	13.06.2022 15.06.2022		TLM2	
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.	Convex hull	1	18.06.2022		TLM2	

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 (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
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.

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
N V NAIK

Course Coordinator
Dr.M.Sitaram

Module Coordinator
Dr.D V Subbaiah

HOD
Dr.D.Veeraiah



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.

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. P. Bhagath	
Course Name & Code	: Data Warehousing and Data mining & 20CS10	
L-T-P Structure	: 3-0-0	Credits: 3
Program/Sem/Sec	: B.Tech/IV/ B	A.Y.: 2021-22
PREREQUISITES	: DBMS, 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

CO1	Summarize the architecture of the 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 over fitting. (Analyze– L4)
CO4	Compare Apriori and FP-growth association rule mining algorithms for frequent itemset generation. (Apply - L3)
CO5	Apply a suitable clustering algorithm for the given data set. (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
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 to Course and COs	1	09-03-22		TLM1,2	
2.	Introduction to Unit-I	1	10-03-22		TLM1,2	
3.	Data Warehouse and OLAP Technology:Multidimensional Data Model	2	11-03-22 16-03-22		TLM1,2	
4.	Data Warehouse and OLAP Technology:Data Warehouse Architecture	2	17-03-22 19-03-22		TLM1,2	
5.	Data Warehouse and OLAP Technology:Data Warehouse Implementation	2	23-03-22 24-03-22		TLM1,2	
6.	Data Warehouse and OLAP Technology:From Data Warehousing to Data Mining.	1	25-03-22		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
7.	Data Mining: Introduction to Data Mining	1	26-03-22		TLM1,2	
8.	Motivating challenges, The origins of Data Mining,	1	30-03-22		TLM1,2	
9.	Data Mining Tasks, Types of Data, Data Quality.	1	31-03-22		TLM1,2	
10.	Data Preprocessing: Aggregation	1	06-04-22		TLM1,2	
11.	Data Preprocessing: Sampling, Dimensionality Reduction, Feature Subset Selection	1	07-04-22		TLM1,2	
12.	Data Preprocessing: Feature creation	1	08-04-22		TLM1,2	
13.	Data Preprocessing: Discretization and Binarization	1	09-04-22		TLM1,2	
14.	Data Preprocessing: Variable Transformation	1	20-04-22		TLM1,2	
15.	Data Preprocessing: Measures of Similarity and Dissimilarity	1	21-04-22		TLM1,2	
No. of classes required to complete UNIT-II: 09				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
16.	Classification :Basic Concepts, General Approach to solving a classification problem	1	22-04-22		TLM1,2	
17.	Decision Tree Induction: Working of Decision Tree, building a decision tree	1	23-04-22		TLM1,2	
18.	methods for expressing an attribute test conditions, measures for selecting the best split	1	27-04-22		TLM1,2	
19.	Algorithm for decision tree induction.	1	28-04-22		TLM1,2	
20.	Model Overfitting: Due to presence of noise, due to lack of representation samples,	1	29-04-22		TLM1,2	
21.	Evaluating the performance of classifier: holdout method, random sub sampling, cross-validation, bootstrap.	2	30-04-22 04-05-22		TLM1,2	
22.	Bayes Theorem	2	07-05-22 11-05-22		TLM1,2	
23.	Naïve Bayes Classifier	2	12-05-22 13-05-22		TLM1,2	
No. of classes required to complete UNIT-III: 11				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
24.	Basic concepts and algorithms	2	14-05-22 18-05-22		TLM1,2	
25.	Frequent Item Set Generation	2	19-05-22 20-05-22		TLM1,2	
26.	Apriori Principle, Apriori Algorithm, Rule Generation	2	21-05-22 25-05-22		TLM1,2	
27.	Compact Representation of Frequent Itemsets	1	26-05-22		TLM1,2	
28.	FPGrowth Algorithm	2	27-05-22 28-05-22		TLM1,2	
No. of classes required to complete UNIT-IV: 9				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
29.	Basic concepts and algorithms	1	01-06-22		TLM1,2	
30.	K-Means Algorithm	2	02-06-22 03-06-22		TLM1,2	
31.	Bisecting K-Means, strengths and weaknesses	1	04-06-22		TLM1,2	
32.	Agglomerative Hierarchical Clustering	2	08-06-22 09-06-22		TLM1,2	
33.	DBSCAN Algorithm	2	10-06-22 11-06-22		TLM1,2	
No. of classes required to complete UNIT-V: 8				No. of classes taken:		

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. P Bhagath	Dr. S Jayaprada	Dr Y Vijaya 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 & 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/B-Sec

A.Y.: 2021-22

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	7-3-2022		TLM2	
2.	Introduction to Operating systems	1	9-3-2022		TLM2	
3.	Introduction to Operating systems	1	10-3-2022		TLM2	
4.	Introduction to Operating systems	1	12-3-2022		TLM2	
5.	Operating system services and user operating system interfaces	1	14-3-2022		TLM2	
6.	System calls and types of system calls	1	19-3-2022		TLM2	
7.	System programs, OS design and implementation	1	19-3-2022		TLM2	
8.	OS structure and Virtual Machine	1	21-3-2022		TLM2	
9.	OS generation and System Boot	1	23-3-2022		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	24-3-2022		TLM2	
11.	Operations on process	1	26-3-2022		TLM2	
12.	IPC and examples on IPC	1	28-3-2022		TLM2	
13.	Communication in client server systems	1	30-3-2022		TLM2	
14.	Treads overview, Multithreading Models,	1	2-4-2022		TLM2	
15.	Thread libraries and Thread issues	1	4-4-2022		TLM2	
16.	Scheduling Criteria	1	6-4-2022		TLM2	
17.	Scheduling algorithms	1	7-4-2022		TLM2	
18.	Scheduling algorithms	1	11-4-2022		TLM2	
19.	Multi-Processor Scheduling	1	13-4-2022		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	13-4-2022		TLM1	
21.	Synchronization hardware	1	18-4-2022		TLM1	
22.	Semaphores, Classic problems of Synchronization	1	20-4-2022		TLM1	

23.	Monitors, Synchronization examples	1	21-4-2022		TLM1
24.	atomic transactions	1	23-4-2022		TLM1
25.	System model and deadlock characterization	1	2-5-2022		TLM1
26.	Methods for Handling deadlocks and deadlock prevention	1	4-5-2022		TLM1
27.	Deadlock Avoidance	1	5-5-2022		TLM1
28.	Deadlock detection	1	7-5-2022		TLM1
29.	Recovery from deadlock	1	9-5-2022		TLM1
No. of classes required to complete UNIT-III: 10					

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Swapping	1	11-5-2022		TLM1	
31.	Contiguous Memory Allocation	1	12-5-2022		TLM1	
32.	Paging and structure of a page table	1	16-5-2022		TLM1	
33.	Segmentation	1	18-5-2022		TLM1	
34.	Demand paging	1	19-5-2022		TLM1	
35.	Page replacement	1	21-5-2022		TLM1	
36.	Allocation of frames	1	23-5-2022		TLM1	
37.	Thrashing	1	25-5-2022		TLM1	
38.	Memory mapped files	1	26-5-2022		TLM1	
39.	Allocating kernel memory	1	28-5-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Overview of Mass storage structure	1	30-5-2022		TLM2	
41.	Disk structure	1	1-6-2022		TLM2	
42.	Disk Attachment	1	2-6-2022		TLM2	
43.	Disk Scheduling	1	4-6-2022		TLM2	
44.	Disk Management	1	6-6-2022		TLM2	
45.	The Concept of a file and access methods	1	8-6-2022		TLM2	
46.	File System structure	1	9-6-2022		TLM2	
47.	File system implementation	1	11-6-2022		TLM2	
48.	Directory implementation	1	13-6-2022		TLM2	
49.	Allocation methods	1	15-6-2022		TLM2	
50.	Free space management	1	16-6-2022		TLM2	
51.	Efficiency and performance, recovery	1	18-6-2022		TLM2	

No. of classes required to complete UNIT-V: 12	No. of classes taken:
---	------------------------------

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

PART-C

EVALUATION PROCESS (R19 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Ms.P.SARALA	Dr.DEVIPRIYA	Dr.D.VENKATA SUBBAIAH	Dr.V.VEERIAAH
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC '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.

hodcse@lbrce.ac.in, csealbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem., CSE
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: CH. SRINIVASA RAO
COURSE COORDINATOR	: CH. SRINIVASA 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)**

4. Course Articulation Matrix:

CO-PO-PSO mapping

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).

TEXTBOOKS:

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 Modelling Language User Guide”, PEARSON ,4th Impression, 2012.

REFERENCE BOOKS:

1. Software Engineering - Concepts and practices: Ugrasen Suman, Cengage learning
2. Object-oriented analysis and design using UML”, Mahesh P. Matha, PHI
3. Fundamentals of Software Engineering, Rajib Mall, Third Edition ,PHI
4. https://onlinecourses.nptel.ac.in/noc20_cs68 [1,2,3,4,5]

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.	Introduction to Software Engineering & Evolving role of Software	1	07/03/22		TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	1	08/03/22		TLM2	CO1	T1	
3.	Legacy Software & Imp of S/W Engineering	1	10/03/22		TLM2	CO1	T1	
4.	Software Myths	1	14/03/22		TLM2	CO1	T1	
5.	S/W Process Models: Layered technology	1	17/03/22		TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	19/03/22		TLM2	CO1	T1,R1	
7.	Software Process Models	1	21/03/22		TLM2	CO1	T1,R1	
8.	Waterfall Model	1	24/03/22		TLM2	CO1	T1,R1	
9.	Incremental Model	1	26/03/22		TLM2	CO1	T1	
10.	Spiral & V Model		28/03/22		TLM2	CO1	T1	
11.	Component based s/w Development & Unified Model	1	31/03/22		TLM2	CO1	T1	
12.	ASSIGNMENT-1				TLM3	CO1	T1	
No. of classes required to complete UNIT-I		11			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	1	04/04/22		TLM2	CO2	T1	
14.	Software Requirements Specification (SRS)	1	07/04/22		TLM2	CO2	T1	
15.	Design Engineering: Overview of design process	1	09/04/22		TLM2	CO2	T1	
16.	Design Concepts	1	11/04/22		TLM2	CO2	T1	
17.	Architectural Concepts	1	16/04/22		TLM2		T1	
18.	ASSIGNMENT-2				TLM3	CO2	T1	
No. of classes required to complete UNIT-2		5			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	1	18/04/22		TLM2	CO3	T1	
20.	Defining Things	1	21/04/22		TLM2	CO3	T1	
21.	Relationships &Diagrams	1	23/04/22		TLM2	CO3	T1	
22.	Common mechanism in UML	1	02/05/22		TLM2	CO3	T1,R1	
23.	Class & Object diagrams	1	05/05/22		TLM2	CO3	T1,R1	
24.	ASSIGNMENT-3	1			TLM3	CO3	T1	
No. of classes required to complete UNIT-3		5			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	1	07/05/22		TLM2	CO4	T1	
26.	Interaction diagrams	1	09/05/22		TLM2	CO4	T1	
27.	Use cases, Use case diagrams	1	12/05/22		TLM2	CO4	T1	
28.	Activity diagrams	1	14/05/22		TLM2	CO4	T1,R1	
29.	Events & Signals	1	16/05/22		TLM2	CO4	T1,R1	
30.	State Machines	1	19/05/22		TLM2	CO4	T1	
31.	Processes & Threads	1	21/05/22		TLM2	CO4	T1	
32.	Time &Space	1	23/05/22		TLM2	CO4	T1	
33.	State Chart diagrams	1	26/05/22		TLM2	CO4	T1	
34.	Architectural Modeling	1	28/05/22		TLM2	CO4	T1	
35.	Component, Deployment diagrams	1	30/05/22		TLM2	CO4	T1	
36.	ASSIGNMENT-4	1			TLM3	CO4	T1,R1	
No. of classes required to complete UNIT-4		11			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	1	02/06/22		TLM2	CO5	T1	
38.	Unit testing	1	04/06/22		TLM2	CO5	T1	
39.	Integration Testing	1	09/06/22		TLM2	CO5	T1,R1,R2	
40.	Black Box Testing	1	11/06/22		TLM2	CO5	T1,R1,R2	
41.	White Box Testing	1	13/06/22		TLM2	CO5	T1	
42.	Debugging	1	16/06/22		TLM2	CO5	T1	
43.	System Testing	1	18/06/22		TLM2	CO5	T1,R1,R2	
44.	ASSIGNMENT-5				TLM3	CO5	T1,R1,R2	
No. of classes required to complete UNIT-5		7			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	Marks
Assignment– 1 (Units I,II&III(Half of the Syllabus))	A1=5
I-Descriptive Examination (Units I, II&III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units I, II&III (Half of the Syllabus))	Q1=10
Assignment– 2 (Units III (remaining Half of the Syllabus),IV&V))	A2=5
II- Descriptive Examination (Units III (remaining Half of the Syllabus), IV&V))	M2=15
II-Quiz Examination (Units III (remaining Half of the Syllabus), IV&V))	Q2=10
Mid Marks=80% of Max((M1+A1+Q1),(M2+A2+Q2))+ 20% of Min((M1+A1+Q1),(M2+A2+Q2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE):	70
Total Marks=CIE+SEE	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	Ch. Srinivasa Rao	Ch. Srinivasa Rao	Dr.CH.V.Narayana	Dr. D. Veeraiah
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (A)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,
Accredited by NAAC and NBA, Certified by ISO 9001:2015)

L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE-B sec
ACADEMIC YEAR : 2021 -22
COURSE NAME & CODE : UNIVERSAL HUMAN VALUES -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: 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	8/03/22		TLM1	CO1	T1	
2.	Basic guide lines, Content of Value Education	1	10/03/22		TLM1	CO1	T1	
3.	Process for Value Education	1	11/03/22		TLM1	CO1	T1	
4.	The process for self-exploration	1	15/03/22		TLM1	CO1	T1, R1	
5.	The process for self-exploration- NA,EV	1	17/03/22		TLM1	CO1	T1, R1	
6.	Continuous Happiness and Prosperity- A look at basic Human Aspirations	1	22/03/22		TLM1	CO1	T1, R1	
7.	Right understanding of Relationship and Physical Facility	1	24/03/22		TLM1	CO1	T1	
8.	Understanding Happiness and Prosperity	1	25/03/22		TLM1	CO1	T1	
No. of classes required to complete UNIT-I:		08	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	29/03/22		TLM1	CO2	T1	
10.	Understanding the needs & activities of Self ('I') and 'Body'	1	31/03/22		TLM1	CO2	T1	
11.	Understanding the Body	1	01/04/22		TLM1	CO2	T1	

	as an instrument of Self							
12.	Understanding the characteristics and activities of 'I' and harmony in 'I';	1	07/04/22		TLM1	CO2	T1	
13.	Understanding the harmony of I with the Body	1	08/04/22		TLM1	CO2	T1, R1	
14.	Indications of Body Health	1	12/04/22		TLM1	CO2	T1, R1	
15.	correct appraisal of Physical needs, meaning of Prosperity in detail	1	19/04/22		TLM1	CO2	T1, R1	
No. of classes required to complete UNIT-II:		07	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	21/04/22		TLM1	CO3	T1	
17.	Understanding relationship and feelings in relationship-"Trust"	1	22/04/22		TLM1	CO3	T1	
18.	Trust and Respect as the foundational values of relationship	1	05/05/22		TLM1	CO3	T1	
19.	Understanding the harmony in the society	1	06/05/22		TLM1	CO3	T1, R1	
20.	Other feelings/values in relationship	1	10/05/22		TLM1	CO3	T1, R1	
21.	LOVE & Infatuation, justice in relationship	1	12/05/22		TLM1	CO3	T1	
22.	Universal Order- from family to world family,	1	13/05/22		TLM1	CO3	T1	
23.	Gratitude as a universal value in relationships	1	17/05/22		TLM1	CO3	T1	
24.		1	19/05/22		TLM1	CO3	T1, R1	
No. of classes required to complete UNIT-III		09	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
25.	Understanding harmony in the Nature	1	20/05/22		TLM1	CO4	T1	
26.	Understanding existence as coexistence	2	24/05/22 & 26/05/22		TLM1	CO4	T1	
27.	Understanding existence as coexistence	1	27/05/22		TLM1	CO4	T1	
28.	Understanding existence as coexistence	2	31/05/22		TLM1	CO4	T1	
29.	Holistic perception of harmony at all levels of	1	02/06/22		TLM1	CO4	T1	

	existence.							
No. of classes required to complete UNIT-IV		07	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
30.	Natural acceptance of human values;	1	03/06/22		TLM1	CO5	T2, R4	
31.	Definitiveness of Ethical Human Conduct	1	07/06/22		TLM1	CO5	T2, R4	
32.	Basis for Humanistic Education,	1	09/06/22		TLM1	CO5	T2, R4	
33.	Humanistic Constitution and Humanistic Universal Order;	1	10/06/22		TLM1	CO5	T2, R4	
34.	Competence in professional ethics,	1	14/06/22		TLM1	CO5	T2, R4	
35.	Strategy for transition from the present state to Universal Human Order	1	16/06/22		TLM1	CO5	T2, R4	
No. of classes required to complete UNIT-V		06	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
36.	Pollution-Human Role	1	17/06/22					
37.	Mutual-Enrichment	1						

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, 3/2	B1=15
I-Mid Online Quiz Examination	1, 2, 3/2	C1 = 10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Descriptive Examination	3/2, 4, 5	B2=15
II-Mid Online Quiz Examination	3/2, 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):

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.CH V NARAYANA	Dr.CH V NARAYANA	Dr.CH V NARAYANA	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 ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. V. 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 : 2021-22

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	10-03-2022		2	
2.	Population explosion and variations among Nations.	1	17-03-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	19-03-2022		2	
4.	Environmental Hazards	1	24-03-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	26-03-2022		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	31-03-2022		2	
2.	Water Resources	1	07-04-2022		2	
3.	Mineral Resources	1	09-04-2022		2	
4.	Food Resources	1	16-04-2022		2	
5.	Mineral Resources	1	16-04-2022		2	
No. of classes required to complete UNIT-II: 5				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	21-04-2022		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	21-04-2022		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of	1	23-04-2022		2	

	India. India as a mega diversity nation					
4.	I MID EXAMINATION		28-04-2022			
5.	I MID EXAMINATION		30-04-2022			
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	05-05-2022		2	
7.	Man and wild life conflicts. Endangered and endemic species of India	1	07-05-2022		2,3	
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	12-05-2022		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	14-05-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	19-05-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		21-05-2022			
4.	Noise Pollution		26-05-2022			
5.	Solid Waste Management	1	28-05-2022		2,3	
6.	Solid Waste Management	1	02-06-2022		2	
7.	CASE STUDIES	1	04-06-2022			
8.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	09-06-2022			
No. of classes required to complete UNIT-IV: 8				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	11-06-2022		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	16-06-2022		2,3	
3.	Environmental Impact Assessment (EIA), Green building, Environmental Law	1	18-06-2022		2	
4.	II MID EXAMINATIONS	1	23-06-2022			
5.	II MID EXAMINATIONS	1	25-06-2022			
6.	II MID EXAMINATIONS	1	30-06-2022			
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. V. 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

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

hodcse@lbrce.ac.in, csealbreddy@gmail.com, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr P Bhagath
 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-B A.Y : 2021-22

PREREQUISITE : 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-C

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	Installing libraries and prerequisites	3	07-03-22		TLM4	

2	Data preprocessing tasks using python libraries – Loading, Dealing with Missing Data	3	14-03-22		TLM4
3	Data preprocessing tasks using python libraries – Dealing with Categorical Data,	3	21-03-22		TLM4
4	Scaling data, Splitting data	3	28-03-22		
5	Similarity and Dissimilarity Measures using python	3	04-04-22		TLM4
6	Build a model using linear regression algorithm for a dataset.	3	11-04-22		TLM4
7	Build a classification model using Decision Tree algorithm on iris dataset	3	18-04-22		TLM4
8	Decision Tree Example	3	25-04-22		TLM4
9	Generate frequent itemsets using Apriori Algorithm in python	3	02-05-22		TLM4
10	Generate association rules for any market basket data.	3	09-05-22		TLM4
11	Apply K- Means clustering algorithm on any dataset.	3	16-05-22		TLM4
12	Apply Hierarchical Clustering algorithm on any dataset.	3	30-05-22		TLM4
13	Apply DBSCAN clustering algorithm on any dataset.	3	06-06-22		TLM4
14	Internal Examination	3	13-06-22		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 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 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 environments 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. P. Bhagath	Dr. S. Jayaprada	Dr. Y. Vijay 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: 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/B

A.Y.:2022-23

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	09-3-22		DM5	
2.	Lab Cycle-1	3	16-3-22		DM5	
3.	Lab Cycle -1	3	23-3-22		DM5	
4.	Lab Cycle-2	3	30-3-22		DM5	
5.	Lab Cycle-2	3	06-4-22		DM5	
6.	Lab Cycle-2	3	13-4-22		DM5	
7.	Lab Cycle-3	3	27-4-22		DM5	
8.	Lab Cycle-3	3	04-5-22		DM5	
9.	Lab Cycle-4	3	11-5-22		DM5	
10.	Lab Cycle5	3	18-5-22		DM5	
11.	Lab Cycle6	3	25-5-22		DM5	
12.	Lab Cycle 6	3	01-6-22		DM5	
13.	Lab Cycle7	3	08-6-22		DM5	
14.	Lab Cycle-8	3	08-6-22		DM5	
15.	Internal exam	3	15-6-22		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

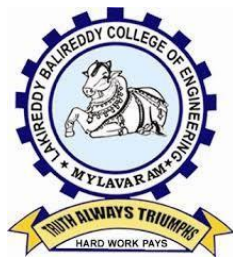
PROGRAMME OUTCOMES (POs):

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	(Ms.P.Sarala)	(Dr. K. Devi Priya)	(Dr. Y.V.B. Reddy)	(Dr. D. Veeraiah)
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC '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, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem., CSE
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING LAB & 20IT55
L-T-P STRUCTURE	: 0-0-3
COURSE CREDITS	: 1.5
COURSE INSTRUCTOR	: CH. SRINIVASA 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. **(Analyze-L4)**

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	1.1.1, 2.2.3, 3.4.1, 12.2.1	2	2	1									1	1		3
CO2	1.1.1, 2.4.2, 2.4.3, 4.3.2, 4.1.3	3	2		2									2		
CO3	1.1.1, 2.1.2, 2.2.3, 2.2.4, 3.1.5, 4.1.2, 4.1.4, 12.1.2	2	3	2	2								2		2	2
CO3	2.4.2, .4.3,4.1.2,4.1.4		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).

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	08/03/2022		DM5	
2.	Lab Cycle-1	3	15/03/2022		DM5	
3.	Lab Cycle -2	3	22/03/2022		DM5	
4.	Lab Cycle-3	3	29/03/2022		DM5	
5.	Lab Cycle-4	3	12/04/2022		DM5	
6.	Lab Cycle-5	3	19/04/2022		DM5	
7.	Lab Cycle-6	3	10/05/2022		DM5	
8.	Lab Cycle-7	3	17/05/2022		DM5	
9.	Lab Cycle-8	3	24/05/2022		DM5	
10.	Lab Cycle-9	3	31/05/2022		DM5	
11.	Lab Cycle-10	3	07/05/2022		DM5	
12.	Lab Cycle -11	3	14/05/2022		DM5	
13.	Internal exam	3	16/06/2022			

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	Ch. Srinivasa Rao	Ch. Srinivasa Rao	Dr.CH.V.Narayana	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, NTR DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. K Devi Priya

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.: 2021-22

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 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, "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.	Lab Cycle-1	3	11-03-2022		DM5	
2.	Lab Cycle-1	3	18-03-2022		DM5	
3.	Lab Cycle-2	3	25-03-2022		DM5	
4.	Lab Cycle-2	3	1-04-2022		DM5	
5.	Lab Cycle-3	3	08-04-2022		DM5	
6.	Lab Cycle-3	3	15-04-2022		DM5	
7.	Lab Cycle-4	3	22-04-2022		DM5	
8.	Lab Cycle-5	3	06-05-2022		DM5	
9.	Lab Cycle-6	3	13-05-2022		DM5	
10.	Lab Cycle-6	3	20-05-2022		DM5	
11.	Lab Cycle-7	3	27-05-2022		DM5	
12.	Lab Cycle-8	3	03-06-2022		DM5	
13.	Lab Cycle-8	3	10-06-2022		DM5	
14.	Lab Cycle-8		17-06-2022		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

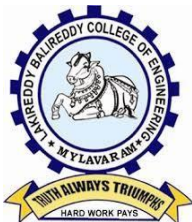
PROGRAMME OUTCOMES (POs):

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	(Dr. K. Devi Priya)	(Dr. K. Devi Priya)	(Dr. Y.V.B. 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, KRISHNA DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. 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: 2021-22

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. (Understand L2)
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	07.03.2022		TLM1	
2.	Algorithm definition and Specifications	1	08.03.2022		TLM1	
3.	Performance Analysis	1	11.03.2022		TLM1	
4.	Time Complexity and space complexity	1	12.03.2022		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	14.03.2022		TLM1	
6.	Divide & Conquer Technique: General Method	1	15.03.2022		TLM1	
7.	Binary Search and its analysis	1	19.03.2022		TLM1	
8.	Finding Maximum and Minimum and its Analysis	1	21.03.2022		TLM1	
9.	Merge sort and its Analysis	1	22.03.2022		TLM1	
10.	Quick Sort algorithm and its analysis	1	25.03.2022		TLM1	
11.	Closest pair of points	1	26.03.2022		TLM1	
12.	Tutorial - 1	1	28.03.2022		TLM3	
No. of classes required to complete UNIT-I		12		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	01.04.2022		TLM1	
15.	Knapsack problem, Example problem	2	04.04.2022		TLM1	
16.	Job sequencing with deadlines, Example problem	1	08.04.2022		TLM1	
17.	Minimum cost	2	09.04.2022&		TLM1	

	spanning trees, example problem		11.04.2022			
18.	Optimal storage on tapes, Example problem	1	12.04.2022		TLM1	
19.	Single source shortest path problem	1	16.04.2022		TLM1	
20.	Huffman coding	1	18.04.2022		TLM1	
21.	Tutorial – II / Quiz - II	1	19.04.2022		TLM3	
No. of classes required to complete UNIT-II		10			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	22.04.2022		TLM1	
23.	Multistage Graph, Example problem	2	23.04.2022 & 02.05.2022		TLM1	
24.	All pairs shortest path, Example problem	2	06.05.2022 & 07.05.2022		TLM1	
25.	Optimal Binary Search Tree, Example problem	2	09.05.2022 & 10.05.2022		TLM1	
26.	0/1 Knapsack Problem	1	13.05.2022		TLM1	
27.	Travelling Salesperson Problem	2	14.05.2022 & 16.05.2022		TLM1	
28.	Single source shortest path problem, Example Problem	1	17.05.2022		TLM1	
29.	Reliability design, Example Problem	2	20.05.2022 & 21.05.2022		TLM1	
30.	Tutorial – III / Quiz - III	1	23.05.2022		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	24.05.2022		TLM1	
32.	The 8-Queens problem	2	27.05.2022 & 28.05.2022		TLM1	

33.	Sum of subsets problem	2	30.05.2022		TLM1	
34.	Graph coloring problem	1	31.05.2022		TLM1	
35.	Hamiltonian cycles	1	28.05.2022 & 30.05.2022		TLM1	
36.	Tutorial – IV / Quiz - IV	1	03.06.2022		TLM3	
No. of classes required to complete UNIT-IV		07		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	04.06.2022		TLM1	
44.	LC Branch and bound solution for Travelling Salesperson Problem	2	06.06.2022		TLM2	
45.	LC Branch and bound solution 0/1 Knapsack problem	1	10.06.2022		TLM2	
46.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	11.06.2022		TLM2	
47.	FIFO Branch and bound solution 0/1 Knapsack problem	1	13.06.2022		TLM2	
48.	LIFO Branch and Bound	1	14.06.2022		TLM2	
49.	Tutorial – V / Quiz - V	1	17.06.2022		TLM3	
50.	Discussion about SEE paper	1	18.06.2022		TLM3	
No. of classes required to complete UNIT-V		10		No of classes taken		

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Convex hull	1	18.06.2022		TLM2	

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 (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
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.

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. Sitharam

Course Coordinator
Dr. M. Sitharam

Module Coordinator
Dr.D V Subbaiah

HOD
Dr.D.Veeraiah



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 & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ch.Nagamani

Course Name & Code : DATAWAREHOUSE AND DATA MINING & 20CS10

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

Credits: 3

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

A.Y.: 2021-22

PREREQUISITE: 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 ware housing 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 data set.(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															
CO2															
CO3															
CO4															
CO5															
			1 - Low			2 -Medium			3 - High						

TEXTBOOKS:

1. Introduction to Data Mining : Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Fifth Impression, Pearson, 2015.
2. Data Mining concepts and Techniques, 3rd Edition, Jiawei Han, Michel Kamber, Elsevier, 2011

REFERENCE BOOKS:

1. Data Mining Techniques and Applications: An Introduction, Hongbo Du, Cengage Learning, 2010.
2. Data Mining : Introductory and Advanced topics : Dunham, First Edition, Pearson, 2020
3. Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH, 2008.
4. Data Mining Techniques, Arun K Pujari, Universities Press, 2001

PART-B**COURSE DELIVERY PLAN (LESSON PLAN: CSE Section-C)****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 Data warehouse & DataMining	1	08.03.22		TLM1	
2.	Data ware house, data mart	1	10.03.22		TLM1, TLM2	
3.	Limitations and purpose of DWH,	1	11.03.22		TLM1, TLM2	
4.	Applications of DWH, OLAP vs OLTP	1	15.03.22		TLM1	
5.	Multi Dimensional DataModel	1	17.03.22		TLM1, TLM2	
6.	Dataware house architecture	1	19.03.22		TLM1, TLM2	
7.	Data Cube – Lattice of cuboids	1	22.03.22		TLM1, TLM2	
8.	Schemas for Multi-Dimensional Databases	1	24.03.22		TLM1, TLM2	
9.	DMQL, OLAP technology in DWH, Operations	1	25.03.22		TLM1	
10.	Datawarehouse Implementation, usage	1	26.03.22		TLM1, TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT –II: Data Mining

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Introduction to DataMining	1	29.03.22		TLM1	
12.	DataMining motivating challenges	1	31.03.22		TLM1, TLM2	
13.	The origins of Data Mining, DM Tasks	1	01.04.22		TLM1, TLM2	
14.	Types of data, data quality	1	07.04.22		TLM1, TLM2	

15.	Data Preprocessing: Aggregation, Sampling,	1	08.04.22		TLM1,TLM2
16.	Dimensionality Reduction, Feature Subset Selection,	1	09.04.22		TLM1,TLM2
17.	Feature creation, Discretization and Binarization	1	12.04.22		TLM1,TLM2
18.	Variable Transformation	1	16.04.22		TLM1,TLM2
19.	Measures of Similarity and Dissimilarity.	1	19.04.22		TLM1,TLM2
20.	Data Mining metrics	1	21.04.22		TLM1,TLM2,TLM3
No. of classes required to complete UNIT-II: 10			No. of classes taken:		

UNIT -III: Classification

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.	Introduction to classification, Basic Concepts	1	22.04.22		TLM1, TLM2	
22.	General Approach to solving a classification problem	1	23.04.22		TLM1, TLM2	
23.	Decision Tree Induction, Working of Decision Tree,	1	05.05.22		TLM1,TLM 2, TLM5	
24.	Building a decision tree, methods for expressing an attribute test conditions	1	06.05.22		TLM1, TLM2, TLM5	
25.	Measures for selecting the best split, Algorithm for decision tree induction.	1	07.05.22		TLM1, TLM2	
26.	Model Overfitting - Due to presence of noise	1	10.05.22		TLM1, TLM2	
27.	Model Overfitting - due to lack of representation samples	1	12.05.22		TLM1, TLM2	
28.	Evaluating the performance of classifier: holdout method, random sub sampling,	1	13.05.22		TLM1, TLM2, TLM5	
29.	Cross-validation, bootstrap. Bayes Theorem,	1	14.05.22		TLM1, TLM2	
30.	Naïve Bayes Classifier, Accuracy	1	17.05.22		TLM1, TLM2	
No. of classes required to complete UNIT-III: 10				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
31.	Basic Concepts on Association	1	19.05.22		TLM1,TLM2	
32.	Problem Definition, Frequent Item Set Generation,	1	20.05.22		TLM1,TLM2	
33.	Apriori Principle – Example	1	21.05.22		TLM1,TLM2	
34.	Apriori Algorithm, Rule Generation,	1	24.05.22		TLM1,TLM2	
35.	Confidence & Support measures	1	26.05.22		TLM1,TLM2	
36.	Formulating Rules based on measures	1	27.05.22		TLM1	
37.	Compact Representation of Frequent Itemsets	1	28.05.22		TLM1	
38.	FPGrowth Algorithm	1	31.05.22		TLM1,TLM2	
39.	Example on Designing FPGrowth tree	1	02.06.22		TLM1,TLM2	
No. of classes required to complete UNIT-IV: 9				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
40.	Introduction to Cluster Analysis	1	03.06.22		TLM1,TLM2	
41.	Different Types of Clustering	1	04.06.22		TLM1,TLM2	
42.	The Basic K-means Algorithm,	1	07.05.22		TLM1,TLM2	
43.	K-means Additional Issues	1	09.05.22		TLM1,TLM2	
44.	Bisecting K-means	1	10.05.22		TLM1,TLM2	
45.	Agglomerative Hierarchical Clustering	1	11.05.22		TLM1,TLM2	
46.	Strengths and Weaknesses of K-means, AHC	1	14.05.22		TLM1,TLM2	
47.	Traditional Density Center-Based Approach	1	16.06.22		TLM1,TLM2	
48.	DBSCAN Algorithm	1	17.06.22		TLM1,TLM2	
49.	Strengths and Weaknesses of DBSCAN	1	18.06.22		TLM1,TLM2	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

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

PART-C

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	G.V.Rajya Lakshmi	Dr.S.Jayaprada	Dr.Y.Vijay 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 & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Ch.nagamani
Course Name & Code : DataMining 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 : 2021-22

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)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

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-C

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	19.03.22		TLM4	
2	Data preprocessing tasks using python libraries – Dealing with Categorical Data, Scaling data, Splitting data	3	26.03.22		TLM4	
3	Similarity and Dissimilarity Measures using python	3	09.04.22		TLM4	
4	Build a model using linear regression algorithm on any dataset.	3	16.04.22		TLM4	
5	Build a classification model using Decision Tree algorithm on iris dataset	3	23.04.22		TLM4	
6	Apply Naïve Bayes Classification algorithm on any dataset	3	07.05.22		TLM4	
7	Generate frequent itemsets using Apriori Algorithm in python	3	14.05.22		TLM4	
8	Generate association rules for any market basket data.	3	21.05.22		TLM4	
9	Apply K- Means clustering algorithm on any dataset.	3	28.05.22		TLM4	
10	Apply Hierarchical Clustering algorithm on any dataset.	3	04.06.22		TLM4	
11	Apply DBSCAN clustering algorithm on any dataset.	3	11.06.22		TLM4	
12	Internal Examination	3	18.06.22		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 team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	G.V.Rajya Lakshmi	Dr.S.Jayaprada	Dr.Y.Vijay 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 & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: A.Praneetha

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.: 2021-22

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	7-3-2022		TLM2	
2.	Introduction to Operating systems	1	8-3-2022		TLM2	
3.	Introduction to Operating systems	1	9-3-2022		TLM2	
4.	Introduction to Operating systems	1	11-3-2022		TLM2	
5.	Operating system services and user operating system interfaces	1	14-3-2022		TLM2	
6.	System calls and types of system calls	1	15-3-2022		TLM2	
7.	System programs, OS design and implementation	1	16-3-2022		TLM2	
8.	OS structure and Virtual Machine	1	21-3-2022		TLM2	
9.	OS generation and System Boot	1	22-3-2022		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	23-3-2022		TLM2	
11.	Operations on process	1	25-3-2022		TLM2	
12.	IPC and examples on IPC	1	28-3-2022		TLM2	
13.	Communication in client server systems	1	29-3-2022		TLM2	
14.	Treads overview, Multithreading Models,	1	1-4-2022		TLM2	
15.	Thread libraries and Thread issues	1	4-4-2022		TLM2	
16.	Scheduling Criteria	1	6-4-2022		TLM2	
17.	Scheduling algorithms	1	8-4-2022		TLM2	
18.	Scheduling algorithms	1	11-4-2022		TLM2	
19.	Multi-Processor Scheduling	1	12-4-2022		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	13-4-2022		TLM1	
21.	Synchronization hardware	1	18-4-2022		TLM1	
22.	Semaphores, Classic problems of Synchronization	1	19-4-2022		TLM1	

23.	Monitors, Synchronization examples	1	20-4-2022		TLM1
24.	atomic transactions	1	22-4-2022		TLM1
25.	System model and deadlock characterization	1	2-5-2022		TLM1
26.	Methods for Handling deadlocks and deadlock prevention	1	4-5-2022		TLM1
27.	Deadlock Avoidance	1	6-5-2022		TLM1
28.	Deadlock detection	1	9-5-2022		TLM1
29.	Recovery from deadlock	1	10-5-2022		TLM1
No. of classes required to complete UNIT-III: 10					

UNIT-IV: Memory mangement

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Swapping	1	11-5-2022		TLM1	
31.	Contiguous Memory Allocation	1	13-5-2022		TLM1	
32.	Paging and structure of a page table	1	16-5-2022		TLM1	
33.	Segmentation	1	17-5-2022		TLM1	
34.	Demand paging	1	18-5-2022		TLM1	
35.	Page replacement	1	20-5-2022		TLM1	
36.	Allocation of frames	1	23-5-2022		TLM1	
37.	Thrashing	1	24-5-2022		TLM1	
38.	Memory mapped files	1	25-5-2022		TLM1	
39.	Allocating kernel memory	1	27-5-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: File System Management

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Overview of Mass storage structure	1	30-5-2022		TLM2	
41.	Disk structure	1	31-5-2022		TLM2	
42.	Disk Attachment	1	1-6-2022		TLM2	
43.	Disk Scheduling	1	3-6-2022		TLM2	
44.	Disk Management	1	6-6-2022		TLM2	
45.	The Concept of a file and access methods	1	7-6-2022		TLM2	
46.	File System structure	1	8-6-2022		TLM2	
47.	File system implementation	1	10-6-2022		TLM2	
48.	Directory implementation	1	13-6-2022		TLM2	
49.	Allocation methods	1	14-6-2022		TLM2	
50.	Free space management	1	15-6-2022		TLM2	
51.	Efficiency and performance, recovery	1	17-6-2022		TLM2	

No. of classes required to complete UNIT-V: 12	No. of classes taken:
---	------------------------------

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

PART-C

EVALUATION PROCESS (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.

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	A.PRANEETHA	Dr.DEVIPRIYA	Dr.D.VENKATA SUBBAIAH	Dr.V.VEERAAIAH
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: A.Praneetha

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.: 2022-23

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	7-3-22		DM5	
2.	Lab Cycle-1	3	14-3-22		DM5	
3.	Lab Cycle -1	3	21-3-22		DM5	
4.	Lab Cycle-2	3	28-3-22		DM5	
5.	Lab Cycle-2	3	4-4-22		DM5	
6.	Lab Cycle-2	3	11-4-22		DM5	
7.	Lab Cycle-3	3	18-4-22		DM5	
8.	Lab Cycle-3	3	2-5-22		DM5	
9.	Lab Cycle-4	3	9-5-22		DM5	
10.	Lab Cycle5	3	16-5-22		DM5	
11.	Lab Cycle6	3	23-5-22		DM5	
12.	Lab Cycle 6	3	23-6-22		DM5	
13.	Lab Cycle7	3	6-6-22			
14.	Lab Cycle-8	3	13-6-22			
15.	Internal exam	3	20-6-22			

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	A.Praneetha	(Dr. K. Devi Priya)	(Dr. Y.V.B. 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.

hodcse@lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem., CSE [C Section]
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING & 20IT01
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: T. VINEETHA
COURSE COORDINATOR	: CH. SRINIVASA 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).

TEXTBOOKS:

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 Modelling Language User Guide” , PEARSON ,4th Impression, 2012.

REFERENCE BOOKS:

1. Software Engineering - Concepts and practices: Ugrasen Suman, Cengage learning
2. Object-oriented analysis and design using UML” , Mahesh P. Matha, PHI
3. Fundamentals of Software Engineering, Rajib Mall, Third Edition ,PHI
4. https://onlinecourses.nptel.ac.in/noc20_cs68 [1,2,3,4,5]

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.	Introduction to Software Engineering & Evolving role of Software	1	08/03/22		TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	1	10/03/22		TLM2	CO1	T1	
3.	Legacy Software & Imp of S/W Engg	1	15/03/22		TLM2	CO1	T1	
4.	Software Myths	1	15/03/22		TLM2	CO1	T1	
5.	S/W Process Models: Layered technology	1	17/03/22		TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	19/03/22		TLM2	CO1	T1,R1	
7.	Software Process Models	1	22/03/22		TLM2	CO1	T1,R1	
8.	Waterfall Model	1	22/03/22		TLM2	CO1	T1,R1	
9.	Incremental Model	1	24/03/22		TLM2	CO1	T1	
10.	Spiral & V Model		26/03/22		TLM2	CO1	T1	
11.	Component based s/w Development & Unified Model	1	29/03/22		TLM2	CO1	T1	

12.	ASSIGNMENT-1				TLM3	CO1	T1	
No. of classes required to complete UNIT-I		11			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	1	31/03/22		TLM2	CO2	T1	
14.	Software Requirements Specification (SRS)	1	07/04/22		TLM2	CO2	T1	
15.	Design Engineering: Overview of design process	1	09/04/22		TLM2	CO2	T1	
16.	Design Concepts	1	12/04/22		TLM2	CO2	T1	
17.	Architectural Concepts	1	16/04/22		TLM2		T1	
18.	ASSIGNMENT-2				TLM3	CO2	T1	
No. of classes required to complete UNIT-2		5			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	1	19/04/22		TLM2	CO3	T1	
20.	Defining Things	1	21/04/22		TLM2	CO3	T1	
21.	Relationships &Diagrams	1	23/04/22		TLM2	CO3	T1	
22.	Common mechanism in UML	1	05/05/22		TLM2	CO3	T1,R1	
23.	Class & Object diagrams	1	07/05/22		TLM2	CO3	T1,R1	
24.	ASSIGNMENT-3	1			TLM3	CO3	T1	
No. of classes required to complete UNIT-3		5			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	1	10/05/22		TLM2	CO4	T1	
26.	Interaction diagrams	1	12/05/22		TLM2	CO4	T1	
27.	Use cases, Use case diagrams	1	14/05/22		TLM2	CO4	T1	
28.	Activity diagrams	1	17/05/22		TLM2	CO4	T1,R1	
29.	Events & Signals	1	19/05/22		TLM2	CO4	T1,R1	
30.	State Machines	1	21/05/22		TLM2	CO4	T1	
31.	Processes & Threads	1	24/05/22		TLM2	CO4	T1	
32.	Time &Space	1	26/05/22		TLM2	CO4	T1	
33.	State Chart diagrams	1	28/05/22		TLM2	CO4	T1	
34.	Architectural Modeling: Component, Deployment	1	31/05/22		TLM2			
35.	Component, Deployment diagrams	1	2/06/22		TLM2			
36.	ASSIGNMENT-4	1			TLM3	CO4	T1,R1	
No. of classes required to complete UNIT-4		11			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	1	04/06/22	05/07/2021	TLM2	CO5	T1	
38.	Unit testing	1	07/06/22		TLM2	CO5	T1	
39.	Integration Testing	1	09/06/22		TLM2	CO5	T1,R1,R2	
40.	Black Box Testing	1	11/06/22		TLM2	CO5	T1,R1,R2	

41.	White Box Testing	1	14/06/22		TLM2	CO5	T1	
42.	Debugging	1	16/06/22		TLM2	CO5	T1	
43.	System Testing	1	18/06/22		TLM2	CO5	T1,R1,R2	
44.	ASSIGNMENT-5				TLM3	CO5	T1,R1,R2	
No. of classes required to complete UNIT-5		7			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):

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.

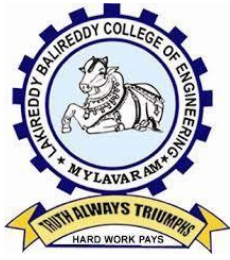
PSO 2

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	T. Vineetha	Ch. Srinivasa Rao	Dr,CH.V.Narayana	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.

hodcse@lbrce.ac.in, csebreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. IV-Sem., CSE [C Section]	ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: SOFTWARE ENGINEERING LAB & 20IT55		
L-T-P STRUCTURE	: 0-0-3		
COURSE CREDITS	: 1.5		
COURSE INSTRUCTOR	: 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

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	09/03/2022		DM5	
2.	Lab Cycle-1	3	16/03/2022		DM5	
3.	Lab Cycle -2	3	23/03/2022 30/03/2022		DM5	
4.	Lab Cycle-3	3	06/04/2022		DM5	
5.	Lab Cycle-4	3	13/04/2022		DM5	
6.	Lab Cycle-5	3	20/04/2022		DM5	
7.	Lab Cycle-6	3	04/05/2022		DM5	
8.	Lab Cycle-7	3	11/05/2022		DM5	
9.	Lab Cycle-8	3	18/05/2022		DM5	
10.	Lab Cycle-9	3	25/05/2022		DM5	
11.	Lab Cycle-10	3	01/06/2022		DM5	
12.	Lab Cycle -11	3	08/06/2022		DM5	
13.	Internal exam	3	15/06/2022			

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	T. Vineetha	Ch. Srinivasa Rao	Dr.CH.V.Narayana	Dr. D. Veeraiah
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (A)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,

Accredited by NAAC and NBA, Certified by ISO 9001:2015)

L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM : B.Tech. IV-Sem., CSE-C sec
ACADEMIC YEAR : 2021 -22
COURSE NAME & CODE : UNIVERSAL HUMAN VALUES -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: 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	07/03/22		TLM1	CO1	T1	
2.	Basic guide lines, Content of Value Education	1	09/03/22		TLM1	CO1	T1	
3.	Process for Value Education	1	11/03/22		TLM1	CO1	T1	
4.	The process for self-exploration	1	14/03/22		TLM1	CO1	T1, R1	
5.	The process for self-exploration- NA,EV	1	16/03/22		TLM1	CO1	T1, R1	
6.	Continuous Happiness and Prosperity- A look at basic Human Aspirations	1	21/03/22		TLM1	CO1	T1, R1	
7.	Right understanding of Relationship and Physical Facility	1	23/03/22		TLM1	CO1	T1	
8.	Understanding Happiness and Prosperity	1	25/03/22		TLM1	CO1	T1	
No. of classes required to complete UNIT-I:		08	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	28/03/22		TLM1	CO2	T1	
10.	Understanding the needs & activities of Self ('I') and 'Body'	1	30/03/22		TLM1	CO2	T1	
11.	Understanding the Body as an instrument of Self	1	01/04/22		TLM1	CO2	T1	
12.	Understanding the characteristics and activities of 'I' and	1	04/04/22		TLM1	CO2	T1	

	harmony in '1';							
13.	Understanding the harmony of I with the Body	1	06/04/22		TLM1	CO2	T1, R1	
14.	Indications of Body Health	1	08/04/22		TLM1	CO2	T1, R1	
15.	correct appraisal of Physical needs, meaning of Prosperity in detail	1	11/04/22		TLM1	CO2	T1, R1	
No. of classes required to complete UNIT-II:		07	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	13/04/22		TLM1	CO3	T1	
17.	meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness	1	18/04/22		TLM1	CO3	T1	
18.	Trust and Respect as the foundational values of relationship	1	20/04/22		TLM1	CO3	T1	
19.	Respect in the relationship	1	22/04/22		TLM1	CO3	T1, R1	
20.	Respect in the relationship	1	02/05/22		TLM1	CO3	T1, R1	
21.	Other feelings in the relationship	1	04/05/22		TLM1	CO3	T1	
22.	Other feelings in the relationship	1	06/05/22		TLM1	CO3	T1	
23.	Reverence in the relationship	1	09/05/22		TLM1	CO3	T1	
24.	Justice in the relationship	1	11/05/22		TLM1	CO3	T1, R1	
No. of classes required to complete UNIT-III		09	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
25.	Understanding harmony in the Nature	1	13/05/22		TLM1	CO4	T1	
26.	Understanding existence as coexistence	2	16/05/22 & 18/05/22		TLM1	CO4	T1	
27.	Understanding existence as coexistence	1	20/05/22		TLM1	CO4	T1	
28.	Understanding existence as coexistence	2	23/05/22		TLM1	CO4	T1	
29.	Holistic perception of harmony at all levels of existence.	1	27/05/22		TLM1	CO4	T1	
No. of classes required to		07	No. of classes taken:					

complete UNIT-IV		
-------------------------	--	--

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
30.	Natural acceptance of human values;	1	30/05/22		TLM1	CO5	T2, R4	
31.	Definitiveness of Ethical Human Conduct	1	01/06/22		TLM1	CO5	T2, R4	
32.	Basis for Humanistic Education,	1	03/06/22		TLM1	CO5	T2, R4	
33.	Humanistic Constitution and Humanistic Universal Order;	1	06/06/22		TLM1	CO5	T2, R4	
34.	Competence in professional ethics,	1	08/06/22		TLM1	CO5	T2, R4	
35.	Strategy for transition from the present state to Universal Human Order	2	10/06/22 & 13/06/22		TLM1	CO5	T2, R4	
No. of classes required to complete UNIT-V		07	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
36.	Pollution-Human Role	1	17/06/22					
37.	Mutual-Enrichment	1	20/06/22					

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):

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.CH V NARAYANA	Dr.CH V NARAYANA	Dr.CH V NARAYANA	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 ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. V. 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 : 2021-22

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	08-03-2022		2	
2.	Population explosion and variations among Nations.	1	11-03-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	15-03-2022		2	
4.	Environmental Hazards	1	22-03-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	25-03-2022		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	29-03-2022		2	
2.	Water Resources	1	01-04-2022		2	
3.	Mineral Resources	1	08-04-2022		2	
4.	Food Resources	1	12-04-2022		2	
5.	Mineral Resources	1	19-04-2022		2	
No. of classes required to complete UNIT-II: 5				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	22-04-2022		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	22-04-2022		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of	1	22-04-2022		2	

	India. India as a mega diversity nation				
4.	I MID EXAMINATION		26-04-2022		
5.	I MID EXAMINATION		29-04-2022		
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	06-05-2022		2
7.	Man and wild life conflicts. Endangered and endemic species of India	1	10-05-2022		2,3
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	10-05-2022		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	13-05-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	17-05-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		20-05-2022			
4.	Noise Pollution		24-05-2022			
5.	Solid Waste Management	1	27-05-2022		2,3	
6.	Solid Waste Management	1	31-05-2022		2	
7.	CASE STUDIES	1	03-06-2022			
8.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	03-06-2022			
No. of classes required to complete UNIT-IV: 8				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	07-06-2022		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	10-06-2022		2,3	
3.	Environmental Impact Assessment (EIA),	1	14-06-2022		2	
4.	Green building, Environmental Law	1	17-06-2022		2,3	
5.	II MID EXAMINATIONS	1	21-06-2022			
6.	II MID EXAMINATIONS	1	24-06-2022			
7.	II MID EXAMINATIONS	1	28-06-2022			
No. of classes required to complete UNIT-V: 04				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. V. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				