



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: A. Sree Rama Chandra Murthy

Course Name & Code : DATA STRUCTURES & 20CS03

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

Program/Sem/Sec : B.Tech/CSE/II

Credits: 3

A.Y.: 2022-23

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.(Understand - L2)
CO2	Apply linear data structures like stack and queue in problem solving.(Apply - L3)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.(Understand - L2)
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(Understand - L2)
CO5	Demonstrate graph traversal techniques and hashing techniques.(Understand - L2)

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

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

TEXTBOOKS:

- T1** Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].
T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

- R1** Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.
R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	14-03-2023		TLM1	
2.	Classification of Data Structures	1	15-03-2023		TLM1	
3.	Introduction to Algorithm	1	16-03-2023		TLM1	
4.	Algorithm Analysis	2	17-03-2023 18-03-2023		TLM1	
5.	Asymptotic Notations	2	21-03-2023 23-03-2023		TLM1	
6.	List using Arrays	1	24-03-2023		TLM1	
7.	Single Linked List	3	25-03-2023 28-03-2023 29-03-2023		TLM1	
8.	Double Linked List	2	31-03-2023 01-04-2023		TLM1	
9.	Circular Linked List	2	04-04-2023 06-04-2023		TLM1	
No. of classes required to complete UNIT-I: 15				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	08-04-2023		TLM1	
11.	STACKS USING ARRAYS	1	11-04-2023		TLM1	
12.	STACKS USING LINKED LIST	1	12-04-2023		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	13-04-2023 15-04-2023		TLM1	
14.	POSTFIX EVALUTION	1	18-04-2023		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	19-04-2023		TLM1	
16.	QUEUE	1	20-04-2023		TLM1	
17.	QUEUE USING ARRAY	1	21-04-2023 25-04-2023		TLM1	
18.	QUEUE USING LINKED LIST	1	26-04-2023		TLM1	
19.	CIRCULAR QUEUE	2	27-04-2023 28-04-2023		TLM1	
20.	DEQUE	2	29-04-2023 02-05-2023		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT-III: SORTING TECHNIQUES

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.	Bubble sort	1	03-05-2023		TLM1	
22.	Insertion Sort	1	04-05-2023		TLM1	
23.	Selection Sort	1	05-05-2023		TLM1	
24.	Merge Sort	2	06-05-2023 16-05-2023		TLM1	
25.	Quick Sort	2	17-05-2023 18-05-2023		TLM1	
26.	Heap Sort	2	19-05-2023		TLM1	

			20-05-2023			
27.	Comparison analysis	1	23-05-2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Introduction, Basic Concepts	2	24-05-2023 25-05-2023		TLM1	
29.	Binary Trees	1	26-05-2023		TLM1	
30.	Representation of Binary Trees	1	27-05-2023		TLM1	
31.	Tree Traversals	2	30-05-2023 31-05-2023		TLM1	
32.	Implementation	1	01-06-2023			
33.	Binary Search Trees	2	02-06-2023 03-06-2023		TLM1	
34.	AVL Trees	1	03-06-2023		TLM1	
35.	Operations	2	06-06-2023 07-06-2023		TLM1	
No. of classes required to complete UNIT-IV: 13				No. of classes taken:		

UNIT-V: GRAPHS & HASHING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	GRAPHS, FUNDAMENTALS	2	08-06-2023 09-06-2023		TLM1	
37.	REPRESENTATION OF GRAPHS	1	10-06-2023		TLM1	
38.	BFS	2	13-06-2023 14-06-2023		TLM1	
39.	DFS	2	15-06-2023 16-06-2023		TLM1	
40.	Hashing Introduction	1	17-06-2023		TLM1	
41.	Hash Table, Hash Function	1	20-06-2023		TLM1	
42.	Types of Hash Functions	1	21-06-2023		TLM1	
43.	Separate Chaining	1	22-06-2023		TLM1	
44.	Linear Probing	1	23-06-2023		TLM1	
45.	Quadratic Probing	1	24-06-2023		TLM1	
46.	Double Hashing	1	27-06-2023		TLM1	
47.	Rehashing	1	28-06-2023		TLM1	
No. of classes required to complete UNIT-V: 15				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 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. Sree Rama Chandra Murthy	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D.Veeriah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: A. Sree Rama Chandra Murthy

Course Name & Code : DATA STRUCTURES LAB & 20CS53

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

Credits: 1.5

Program/Sem/Sec : B.Tech/CSE/II

A.Y.: 2022-23

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)

CO2: Implement Various Sorting Techniques. (**Apply - L3**)

CO3: Implement Non-Linear Data Structure such as Trees & Graphs. (**Apply - L3**)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

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

PART-B:**COURSE DELIVERY PLAN (LESSON PLAN):**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	List Using Arrays	3	13-03-2023		
2.	Single Linked List	3	20-03-2023		
3.	Double Linked List Circular Linked List	3	27-03-2023		
4.	<i>Stack Using Arrays</i> <i>Stack Using Linked List</i>	3	03-04-2023		
5.	<i>Queue Using Arrays</i> <i>Queue Using Linked List</i>	3	10-04-2023		
6.	Conversions	3	17-04-2023		
7.	Evaluation of Postfix, Balanced Parenthesis	3	24-04-2023		
8.	Circular Queue, Double Ended Queue	3	01-05-2023		
9.	Bubble Sort, Insertion Sort, Selection Sort	3	15-05-2023		
10.	Merge Sort, Quick Sort	3	22-05-2023		
11.	Heap Sort, Binary Tree	3	29-05-2023		
12.	Binary Search Tree Operations	3	05-06-2023		
13.	BFS,DFS	3	12-06-2023		
14.	BFS,DFS	3	19-06-2023		
15.	Internal Exam	3	26-07-2023		

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 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	A. S. R. C. Murthy	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D. Veeriah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

PROGRAM/SEM/SEC	: I B. Tech., II-Sem., CSE A
ACADEMIC YEAR	: 2022-23
COURSE NAME & CODE	: Linear algebra & Transformation Techniques & 20FE04
L-T-P STRUCTURE	: 3-1-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Mrs. K. N. V. Lakshmi
COURSE COORDINATOR	: Dr. K. Jhansi Rani
PRE-REQUISITES	: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

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

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (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	2	-	2	-	-	-	-	-	-	-	1			
CO2	3	2	-	2	-	-	-	-	-	-	-	1			
CO3	3	2	-	2	-	-	-	-	-	-	-	1			
CO4	2	1	-	1	-	-	-	-	-	-	-	1			
CO5	3	2	-	2	-	-	-	-	-	-	-	1			
			1 - Low			2 -Medium			3 - High						

TEXTBOOKS:

- T1** Dr. B.S. Grewal, “Higher Engineering Mathematics”, 42nd Edition, Khanna Publishers, New Delhi, 2012.
- T2** Dr. B. V. Ramana, “Higher Engineering Mathematics”, 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

- R1** M. D. Greenberg, “Advanced Engineering Mathematics”, 2nd Edition, TMH Publications, New Delhi, 2011.
- R2** Erwin Kreyszig, “Advanced Engineering Mathematics”, 8th Edition, John Wiley & sons, New Delhi, 2011.
- R3** W.E. Boyce and R. C. DiPrima, “Elementary Differential Equations”, 7th Edition, John Wiley & sons, New Delhi, 2011.

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 the course, Course Outcomes	1	14/03/23		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to UNIT I	1	15/03/23		TLM1	
3.	Matrices and rank of a matrix	1	17/03/23		TLM1	
4.	Echelon form of a matrix	1	18/03/23		TLM1	
5.	Normal form of a matrix	1	21/03/23		TLM1	
6.	Normal form of a matrix	1	24/03/23		TLM1	
7.	PAQ form	1	25/03/23		TLM1	
8.	Solution of Non-homogeneous linear system of equations	1	28/03/23		TLM1	
9.	Solution of Non-homogeneous Linear system of equations	1	29/03/23		TLM1	
10.	Solution of Homogeneous Linear system of equations	1	31/03/23		TLM1	
11.	Tutorial 1	1	01/04/23		TLM3	
12.	Solution of Homogeneous Linear system of equations	1	04/04/23		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	11/04/23		TLM1	
14.	Eigen values of a matrix	1	12/04/23		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	15/04/23		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	18/04/23		TLM1	
17.	Properties	1	19/04/23			
18.	Cayley – Hamilton Theorem.	1	21/04/23		TLM1	
19.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	25/04/23		TLM1	
20.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	26/04/23		TLM1	
21.	Tutorial 2	1	28/04/23		TLM3	
No. of classes required to complete UNIT-II: 9				No. of classes taken:		

UNIT-III: Laplace Transforms

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.	Introduction to Unit-III	1	29/04/23		TLM1		
23.	Standard forms of Laplace Transforms.	1	02/05/23		TLM1		
24.	Linear Property, Shifting Theorem.	1	03/05/23		TLM1		
25.	Change of scale property, Multiplication by t.	1	05/05/23		TLM1		
26.	Multiplication by t.	1	06/05/23		TLM1		
I MID EXAMINATIONS (08-05-2023 TO 13-05-2023)							
27.	Division by t	1	16/05/23		TLM1		
28.	Laplace transforms of derivatives.	1	17/05/23		TLM 1		
29.	Laplace transforms of Integrals.	1	19/05/23		TLM1		
30.	Tutorial 3	1	20/05/23		TLM3		

31.	Unit step function and Dirac's delta function.	1	23/05/23		TLM1	
32.	Application of Laplace Transforms.	1	24/05/23		TLM1	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction to UNIT IV.	1	26/05/23		TLM1	
34.	Linear property.	1	27/05/23		TLM1	
35.	First Shifting properties.	1	30/05/23		TLM1	
36.	Inverse transforms properties	1	31/05/23		TLM1	
37.	Problems	1	02/06/23		TLM1	
38.	Inverse Laplace transform by using partial fractions.	1	03/06/23		TLM1	
39.	Inverse Laplace transform by using partial fractions.	1	06/06/23		TLM1	
40.	Inverse Laplace Transform by using Convolution theorem.	1	07/06/23		TLM1	
41.	Inverse Laplace Transform by using Convolution theorem.	1	09/06/23		TLM1	
42.	Solving of Ordinary differential equation by Laplace transform method.	1	13/06/23		TLM1	
43.	Solving of Ordinary differential equation by Laplace transform method.	1	14/06/23		TLM1	
44.	Tutorial 4	1	16/06/23		TLM3	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Introduction to UNIT V.	1	17/06/23		TLM1	
46.	Standard forms of Z- Transform.	1	20/06/23		TLM1	
47.	Damping rule	1	21/06/23		TLM1	
48.	Shifting Rule	1	23/06/23		TLM1	
49.	Initial and final value theorems.	1	24/06/23		TLM1	
50.	Other properties	1	27/06/23		TLM1	
51.	Inverse Z – Transforms by using partial fractions.	1	28/06/23		TLM1	
52.	Inverse Z – Transform by using convolution theorem.	1	30/06/23		TLM1	
53.	Solving of Difference equations by using Z – Transforms.	1	01/07/23		TLM1	
54.	Solving of Difference equations by using Z – Transforms.	1	04/07/23		TLM1	
55.	Tutorial 5	1	05/07/23		TLM3	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
57.	Solving Simultaneous equations using Laplace Transforms	1	07/07/23		TLM2	

II MID EXAMINATIONS (10-07-2023 TO 15-07-2023)

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	K. N. V. Lakshmi	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. A. Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha
Course Name & Code : Engineering Chemistry Lab & 20FE53
L-T-P Structure : 0-0-3
Program/Sem/Sec : B.Tech/II-Sem/CSE-A

Credits: 1.5
A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: This course enables the students to analyze water samples and perform different types of volumetric titrations. It provides them with an overview of preparation of polymers and analytical techniques.

Course Outcomes: At the end of the course, the student shall be able to

CO1: Assess alkalinity of water based on the procedure given. (L2)

CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (L2)

CO3: Acquire practical knowledge related to preparation of polymers. (L2)

CO4: Exhibit skills in performing experiments based on theoretical fundamentals. (L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low)			2 = Moderate (Medium)				3 = Substantial (High)					

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

REFERENCE: BOS Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Experiment	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	HOD Sign
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		Required	Completion	Completion	Methods	COs	Weekly
48.	Introduction to Engineering Chemistry lab	3	17-03-2023		TLM1	CO4	
49.	Introduction to volumetric analysis.	3	24-03-2023		TLM1	CO4	
50.	Determination of pH of the given sample solution/soil using pH meter.	3	31-03-2023		TLM4	CO3,CO4	
51.	Determination of amount of Na ₂ CO ₃ using standard HCl solution.	3	21-04-2023		TLM4	CO2,CO4	
52.	Determination of alkalinity of water sample.	3	28-04-2023		TLM4	CO3,CO4	
53.	Determination of Mg ⁺² using standard EDTA solution.	3	05-05-2023		TLM4	CO2,CO4	
54.	Estimation of Mohr's salt using potassium permanganate.	3	19-05-2023		TLM4	CO2,CO4	
55.	Estimation of Mohr's salt using potassium dichromate.	3	26-05-2023		TLM4	CO2,CO4	
56.	Preparation of Bakelite	3	02-06-2023		TLM4	CO1,CO4	
57.	Preparation of nylon fibres.	3	09-06-2023		TLM4	CO2,CO4	
58.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	16-06-2023		TLM4	CO2,CO4	
59.	Estimation of amount of HCl conductometrically using NH ₄ OH solution	3	23-06-2023		TLM4	CO2,CO4	
60.	Revision	3	30-06-2023		TLM4	CO2,CO4	
61.	Lab Internal Exam(Batch-I)	3	07-07-2023		TLM4	CO2,CO4	
62.	Lab Internal Exam(Batch-II)	3	07-07-2023		TLM4	CO2,CO4	
Total							

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		15 Marks

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha
Course Name & Code : Engineering Chemistry & 20FE06
L-T-P Structure : 3-0-0 **Credits :03**
Program/Sem/Sec : B.Tech/II-sem/CSE- A **A.Y.** : 2022-23

Pre-requisites: Nil

Course Educational Objectives: It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques.

COURSE OUTCOMES (COs): After completion of the course, students will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications (L3)
CO2	Apply principles of corrosion for design and effective maintenance of various equipment. (L3)
CO3	Analyze the suitability of advanced materials like nano-materials in electronics and medicine (L4)
CO4	Identify the importance of liquid crystals, polymers in advanced technologies (L2)
CO5	Apply the principles of analytical techniques in chemical analysis (L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	2	-	-	-	-	2
CO2	3	2	2	1	-	2	1	-	-	-	-	2
CO3	3	2	2	1	-	1	1	-	-	-	-	2
CO4	3	2	2	1	-	1	1	-	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	-	2
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

BOS APPROVED TEXT BOOKS:

- T1** Shikha Agarwal, "A Text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015
- T2** Jain, Jain, "A textbook of Engineering Chemistry", Dhanpat Rai Publishing Company, New I 16th Edition, 2015.

BOS APPROVED REFERENCE BOOKS:

- R1** Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, Delhi, 3rd Edition, 2003.
- R2** S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010
- R3** Prasanta Rath, B. Rama Devi, Ch. Venkata Ramana Reddy, Subhendu Chakroborty, "Engineering Chemistry", Cengage Learning India, 1st Edition, 2019.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: ELECTRO CHEMISTRY & BATTERIES**

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	14-03-2023		TLM1	
2	Prerequisites for Unit-I	1	15-03-2023		TLM1	
3	Applications of Electro-chemical Series	1	16-03-2023		TLM1	
4	Calculation of EMF of Cell	1	17-03-2023		TLM1	
5	Practice exercises on applications of Electro chemical series	1	21-03-2023		TLM1	
6	Glass Electrode	1	23-03-2023		TLM1	
7	Calomel Electrode	1	24-03-2023		TLM1	
8	Applications of Nernst Equation	1	28-03-2023		TLM3	
9	Lead-acid Battery	1	29-03-2023		TLM1	
10	Lithium-ion Battery, Mg-Cu Reserve Battery	1	31-03-2023		TLM1	
11	H ₂ – O ₂ Fuel cell	1	04-04-2023		TLM1	
12	Revision of Unit 1, Assignment & Quiz	1	06-04-2023		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
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1	Definition, Examples, Dry corrosion	1	11-04-2023		TLM1
2	Corrosion by other gases and liquid metal corrosion	1	12-04-2023		TLM1
3	Contd.. Dry corrosion, pilling bed worth rule, Conditions for wet corrosion	1	13-04-2023		TLM1
4	Mechanism- oxygen absorption, hydrogen evolution, types of wet corrosion	1	18-04-2023		TLM1
5	Galvanic Corrosion, passivity and Galvanic series	1	19-04-2023		TLM1
6	Concentration Cell Corrosion	1	20-04-2023		TLM1
7	Nature of metal, Nature of environment	1	21-04-2023		TLM1
8	Cathodic Protection	1	25-04-2023		TLM1
9	Electroplating, metal cladding.	1	26-04-2023		TLM1
10	Revision of Unit II, Assignment & Quiz	1	27-04-2023		TLM1
No. of classes required to complete UNIT-II: 10				No. of classes taken:	

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials, ,	1	28-04-2023		TLM1	
2.	Gas-Phase Synthesis of nanomaterials	1	02-05-2023		TLM1	
3.	Applications of nano materials	1	03-05-2023		TLM2	
4.	Materials in Electronic devices.	1	04-05-2023		TLM1	
5.	Contd.. Materials in Electronic devices	1	05-05-2023		TLM1	
6.	Characteristics of Molecular motors and machines	1	16-05-2023		TLM2	
7.	Characteristics of Molecular motors and machines	1	17-05-2023		TLM2	
8.	Rotaxanes as artificial molecular machines	1	18-05-2023		TLM1	
9.	Catenanes as artificial molecular machines	1	19-05-2023		TLM2	
10.	Automated light powered molecular motars	1	23-05-2023		TLM2	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: LIQUID CRYSTALS & POLYMERS

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 of liquid crystals	1	24-05-2023		TLM1	
2.	Mechanism of working liquid crystals & their applications	1	25-05-2023		TLM1	
3.	Introduction and types of polymerizations,	1	26-05-2023		TLM1	
4.	Preparation, properties and engineering applications of P.M.M.A, Teflon	1	30-05-2023 & 31-05-2023		TLM2	
5.	Preparation properties and engineering applications of Polycarbonate, Structure of raw rubber and vulcanized rubber	1	01-06-2023 & 02-06-2023		TLM1	
6.	Preparation properties and engineering applications of Polyurethane, Buna-S	1	06-06-2023 & 07-06-2023		TLM1	
7.	Conducting polymers	1	08-06-2023		TLM1	
8.	Biodegradable polymers	1	09-06-2023		TLM1	
9.	Revision of Unit IV, Assignment & Quiz	1	13-06-2023		TLM1	
No. of classes required to complete UNIT-IV:12				No. of classes taken:		

UNIT-V: ANALYTICAL TECHNIQUES

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	Types of analysis	1	14-06-2023		TLM1	
2	Principle of conductometric titrations, Strong acid vs strong base titrations	1	15-06-2023		TLM1	
3	Strong acid vs weak base titrations, Strong base vs weak acid titrations	1	16-06-2023		TLM1	
4	Weak acid vs weak base titrations	1	20-06-2023		TLM1	
5	Principle of potentiometry Acid-base titration	1	21-06-2023		TLM1	
6	Redox titration	1	22-06-2023		TLM1	
7	Colorimetry, Principle and determination of iron by using thiocynate as a reagent	1	23-06-2023 & 27-06-2023		TLM1	
8	Revision of Unit V	1	28-06-2023 & 30-06-2023		TLM1	
9	Assignment & Quiz	1	04-07-2023		TLM1	

No. of classes required to complete UNIT-V: 11	No. of classes taken:
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CONTENTS BEYOND SYLLABUS						
1	Batteries used in mobile phones of popular companies	1	05-07-2023		TLM1	
2	Polymers in industrial applications	1	06-07-2023		TLM1	
3	Applications of electroplating with ref to PCBs	1	07-07-2023		TLM1	

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 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.
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PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-

A

Name of Course Instructor : Dr.Y.Vijay Bhaskar Reddy
Course Name & Code : Python Programming (20CS05)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech. – CSE / II Sem / A A.Y. : 2022 – 23

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

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

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

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

TEXTBOOKS:

- T1:** Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford Publications
T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

- R1:** Gowrishankar S and Veena A, “Introduction to Python Programming”, CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK
R2: R. Nageswara Rao, “Core python programming”, Dreamtech, 2017.

R3: Y. Daniel Liang, “Revel for Introduction to Python Programming and Data Structures”, Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	1	13/03/2023			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	1	14/03/2023			
3.	Python Built-in Types, Variables, Indentation	1	15/03/2023			
4.	Input-Output Statements	1	16/03/2023			
5.	Identifiers, Keywords, Literals, Simple Programs	1	18/03/2023			
6.	Operators in Python	1	20/03/2023			
7.	Operator Precedence, Programming Examples	1	21/03/2023			
8.	Conditional Statements – if, if-else, Nested If-else	1	23/03/2023			
9.	Python Loops – While loop, while loop with else, sample programs	1	25/03/2023			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	27/03/2023			
11.	Jumping Statements – continue, break, pass	1	28/03/2023			
12.	Mathematical functions & constants, Random Number functions	1	29/03/2023			
No. of classes required to complete UNIT – I: 12				No. of classes taken:		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	List: Basics of List, Creating and Accessing Elements	1	01/04/2023			
14.	Updating Lists & Deleting Lists, Sample Programs	1	03/04/2023			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	04/04/2023			
16.	Operations on Matrices	1	05/04/2023			
17.	Built-in List Functions	1	06/04/2023			
18.	Tuples: Basics of Tuples, Creating and Deleting elements in a Tuple	1	10/04/2023			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	11/04/2023			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	12/04/2023			
21.	Sets: Basics of Sets, Operations on sets, Sample Programs	1	13/04/2023			
22.	Dictionaries: Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	15/04/2023			
23.	Dictionary Properties & Functions	1	17/04/2023			
No. of classes required to complete UNIT – II: 11				No. of classes taken:		

UNIT – III: Functions, Modular Design & Exception Handling

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.	Functions: Basics of Function, Defining and Calling a function, Sample Programs	1	18/04/2023			
25.	Types of functions, Function Arguments, Anonymous functions	1	19/04/2023			
26.	Global and Local variables, Sample Programs	1	20/04/2023			
27.	Recursion, Sample Programs	1	24/04/2023			
28.	Modular Design: Introduction to Modules, creating a Module, import statement	1	25/04/2023			
29.	from statement, Date and Time Module	1	26/04/2023			
30.	Programs on Modules	1	27/04/2023			
31.	Exception Handling: Basics of Exception, except clause, try clause	1	29/04/2023			
32.	Finally clause and User Defined Exceptions	1	01/05/2023			
No. of classes required to complete UNIT – III: 09				No. of classes taken:		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Strings: Basics of Strings, Slicing, Escape Characters	1	02/05/2023			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	1	03/05/2023			
35.	Built-in string methods	1	04/05/2023			
36.	Programs on Strings	1	06/05/2023			
37.	Regular Expressions: Using Special Characters, Regular Expression Methods	1	08/05/2023			
38.	Named Groups in Python RegEx, glob Module	1	09/05/2023			
39.	Programs on Regular Expressions	1	10/05/2023			
40.	Files: Basics of File, Creating files	1	11/05/2023			
41.	Operation on files – Read, Write and Search	1	29/05/2023			
No. of classes required to complete UNIT – IV: 09				No. of classes taken:		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	30/05/2023			
43.	Introduction to Classes	1	31/05/2023			
44.	Programming Examples	3	01/06/2023			
45.	Self-Variable, Methods	1	06/06/2023			

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
52.	Introduction to NumPy	2	22/06/2023			
53.	Introduction to Pandas	2	26/06/2023			
54.	Basic Operations using NumPy and Pandas	1	03/07/2023			

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 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):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Y.V. Bhaskar Reddy	Dr. Y.V. Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-

A

Name of Course Instructor : Dr. Y.Vijay Bhaskar Reddy
 Course Name & Code : Python Programming Lab (20CS54)
 L-T-P Structure : 0-0-3 Credits : 1.5
 Program/Sem/Sec : B.Tech. – CSE / II Sem / A A.Y. : 2022 – 23

PRE-REQUISITE: Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem-solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO1:	Apply building blocks of Python in solving computational problems.	Apply – Level 3
CO2:	Implement in-built data structures available in Python to solve computational problems.	Apply – Level 3
CO3:	Implement modular programming, string manipulations and Object-oriented programming in python.	Apply – Level 3
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	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 – Low			2 – Medium						3 – High						

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Python IDE Installation and Basics of Python	3	3	15/03/2023	DM5
2.	Language basics and example problems	6	9	29/03/2023 12/04/2023 19/04/2023	DM5
3.	Programs on Lists	3	3	26/04/2023	DM5
4.	Programs on Tuples	3	3	03/05/2023	DM5
5.	Programs on Sets	3	3	10/05/2023	DM5
6.	Programs on Dictionaries	3	3	17/05/2023	DM5
7.	Programs on Functions and Recursion	3	3	24/05/2023	DM5
8.	Programs on Date and Time Modules, Exception Handling	3	3	31/05/2023	DM5
9.	Programs on Strings	3	3	07/06/2023	DM5
10.	Programs on Regular Expressions	3	3	14/06/2023	DM5
11.	Programs on Object-Oriented Programming	3	3	21/06/2023	DM5
12.	Programs on Python Libraries – Numpy , Pandas , Matplotlib	3	3	28/06/2023	DM5
13.	Internal Lab Exam	3	3	05/07/2023	DM4

Delivery 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 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):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Y.V.Bhaskar Reddy	Dr. Y.V.Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	:	Mr. B. Sreenivasa Reddy	
Course Name & Code	:	PC-II, 20FE02	
L-T-P Structure	:	2-0-0	Credits: 02
Program/Sem/Sec	:	CSE -A- II SEM	
A.Y.	:	2022-23	

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

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

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
CO5	Write well structured essays; Reports & Résumé.	L3

UNIT-I

Fabric of Change-'H.G. Wells and the Uncertainties of Progress-Peter J. Bowler'; Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary: Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting; Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian - Sui Sin Far';

Reading: Global Comprehension; Detailed Comprehension; Grammar & Vocabulary: Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays using suitable claims and evidences.

UNIT-III

'Homi Jahangir Bhabha'; Grammar & Vocabulary: Words often confused; Common Errors; Writing: Incident & Investigation Reports.

UNIT-IV

'Jagadish Chandra Bose'; Grammar & Vocabulary: Use of antonyms; Correction of Sentences; Writing: Dialogue Writing.

UNIT-V

'Prafulla Chandra Ray'; Grammar & Vocabulary: Analogy; Sentence Completion; Writing: Writing a Résumé

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

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

TEXTBOOKS:

- T1** Prabhavati. Y & etal , “English All Round –Communication Skills for Undergraduate Learners” ,Orient Black Swan, Hyderabad, 2019
- T2** “The Great Indian Scientists” published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

- R1** Swan, M., “Practical English Usage”, Oxford University Press, 2016.
- R2** Kumar, Sand Latha, P, “Communication Skills”, Oxford University Press, 2018.
- R3** Rizvi Ashraf M., “Effective Technical Communication”, Tata Mc Graw Hill, NewDelhi, 2008.
- R4** Baradwaj Kumkum, “Professional Communication”,I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.
- R5** Wood, F. T., “Remedial English Grammar” , Macmillan, 2007.

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	13-03-2023		TLM2	
2.	Fabric of Change- ‘H.G. Wells and the Uncertainties of Progress– Peter J. Bowler’	03	14-03-2023 18-03-2023 20-03-2023		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	21-03-2023		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	25-03-2023		TLM2	
5.	Adjectives and adverbs	01	27-03-2023		TLM2	
6.	Degrees of Comparison	01	28-03-2023		TLM2	
7.	Writing: Information Transfer.	01	01-04-2023		TLM2 TLM6	
No. of classes required to complete UNIT-I: 09				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';	03	03-04-2023 08-04-2023 10-04-2023		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	11-04-2023		TLM2	
10.	Active & Passive Voice	02	15-04-2023 17-04-2023		TLM2	
11.	Idioms & Phrases	02	18-04-2023 24-04-2023		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	02	25-04-2023 29-04-2023		TLM2 TLM6	
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
13.	'Homi Jahangir Bhabha'	03	01-05-2023 02-05-2023 06-05-2023		TLM2 TLM6	
14.	Words often confused	01	15-05-2023		TLM2	
15.	Common Errors	02	16-05-2023 20-05-2023		TLM2	
16.	Report Writing – Types & Formats	02	22-05-2023 23-05-2023		TLM2	
17.	Incident and Investigation Reports	01	27-05-2023		TLM2 TLM6	
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Jagadish Chandra Bose	03	29-05-2023 30-05-2023 03-06-2023		TLM2 TLM2	
19.	Use of antonyms	02	05-06-2023 06-06-2023		TLM2	
20.	Correction of Sentences	01	10-06-2023		TLM2	
21.	Formal and Informal dialogues	01	12-06-2023		TLM2	
22.	Dialogue Writing.	02	13-06-2023 17-06-2023		TLM2	

					TLM6	
No. of classes required to complete UNIT-IV: 09				No. of classes taken:		

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Prafulla Chandra Ray	02	19-06-2023 20-06-2023		TLM2	
24.	Analogy	03	24-06-2023 26-06-2023 27-06-2023		TLM2	
25.	Sentence Completion	01	01-07-2023		TLM2	
26.	Resume - Formats	01	03-07-2023		TLM2	
27.	Writing a Résumé	02	04-07-2023 08-07-2023		TLM2 TLM6	
No. of classes required to complete UNIT-V: 09				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 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	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyses the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	B. Sreenivasa Reddy			Dr. A. Ramireddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	:	Mr. B. Sreenivasa Reddy	
Course Name & Code	:	PC-II, 20FE02	
L-T-P Structure	:	2-0-0	Credits: 02
Program/Sem/Sec	:	CSE -B- II SEM	
A.Y.	:	2022-23	

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

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

C01	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
C02	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
C03	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
C04	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
C05	Write well structured essays; Reports &Résumé.	L3

UNIT-I

Fabric of Change-‘H.G. Wells and the Uncertainties of Progress–Peter J. Bowler’;
Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary:
Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting;
Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - ‘Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far’;
Reading: Global Comprehension; Detailed Comprehension; Grammar &
Vocabulary: Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays
using suitable claims and evidences.

UNIT-III

‘Homi Jahangir Bhabha’; Grammar & Vocabulary: Words often confused; Common Errors;
Writing: Incident & Investigation Reports.

UNIT-IV

‘Jagadish Chandra Bose’; Grammar & Vocabulary: Use of antonyms; Correction of
Sentences; Writing: Dialogue Writing.

UNIT-V

'Prafulla Chandra Ray'; Grammar & Vocabulary: Analogy; Sentence Completion;
Writing: Writing a Résumé

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

TEXTBOOKS:

- T1** Prabhavati. Y & etal , “English All Round –Communication Skills for Undergraduate Learners” ,Orient Black Swan, Hyderabad, 2019
- T2** “The Great Indian Scientists” published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

- R1** Swan, M., “Practical English Usage”, Oxford University Press, 2016.
- R2** Kumar, Sand Latha, P, “Communication Skills”, Oxford University Press, 2018.
- R3** Rizvi Ashraf M., “Effective Technical Communication”, Tata Mc Graw Hill, NewDelhi, 2008.
- R4** Baradwaj Kumkum, “Professional Communication”,I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.
- R5** Wood, F. T., “Remedial English Grammar” , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	14-03-2023		TLM2	
2.	Fabric of Change -‘H.G. Wells and the Uncertainties of Progress– Peter J. Bowler’	03	15-03-2023 16-03-2023 21-03-2023		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	23-03-2023		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	28-03-2023		TLM2	
5.	Adjectives and adverbs	01	29-03-2023		TLM2	
6.	Degrees of Comparison	01	04-04-2023		TLM2	
7.	Writing: Information Transfer.	01	06-04-2023		TLM2 TLM6	
No. of classes required to complete UNIT-I: 09				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';	03	11-04-2023 12-04-2023 13-04-2023		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	18-04-2023		TLM2	
10.	Active & Passive Voice	02	19-04-2023 20-04-2023		TLM2	
11.	Idioms & Phrases	02	25-04-2023 26-04-2023		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	01	27-04-2023		TLM2 TLM6	
No. of classes required to complete UNIT-II: 09				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
13.	'Homi Jahangir Bhabha'	03	02-05-2023 03-05-2023 04-05-2023		TLM2 TLM6	
14.	Words often confused	01	16-05-2023		TLM2	
15.	Common Errors	02	17-05-2023 18-05-2023		TLM2	
16.	Report Writing – Types & Formats	02	23-05-2023 24-05-2023		TLM2	
17.	Incident and Investigation Reports	01	25-05-2023		TLM2 TLM6	
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Jagdish Chandra Bose	03	30-05-2023 31-05-2023 01-06-2023		TLM2 TLM2	

19.	Use of antonyms	02	06-06-2023 07-06-2023		TLM2	
20.	Correction of Sentences	01	08-06-2023		TLM2	
21.	Formal and Informal dialogues	01	13-06-2023		TLM2	
22.	Dialogue Writing.	02	14-06-2023 15-06-2023		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 09					No. of classes taken:	

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Prafulla Chandra Ray	02	20-06-2023 21-06-2023		TLM2	
24.	Analogy	03	22-06-2023 27-06-2023 28-06-2023		TLM2	
25.	Sentence Completion	01	04-07-2023		TLM2	
26.	Resume - Formats	01	05-07-2023		TLM2	
27.	Writing a Résumé	01	06-07-2023		TLM2 TLM6	
No. of classes required to complete UNIT-V: 08					No. of classes taken:	

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

PART-C

EVALUATION PROCESS (R20 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	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyses the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	B. Sreenivasa Reddy			Dr. A. Ramireddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM/SEM/SEC	: I B. Tech., II-Sem., CSE-B
ACADEMIC YEAR	: 2022-23
COURSE NAME & CODE	: Linear algebra & Transformation Techniques & 20FE04
L-T-P STRUCTURE	: 3-1-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: G.VIJAYA LAKSHMI
COURSE COORDINATOR	: Dr. K. Jhansi Rani
PRE-REQUISITES	: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

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

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (Apply L3)

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

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

TEXTBOOKS:

T1 Dr. B.S. Grewal, “Higher Engineering Mathematics”, 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, “Higher Engineering Mathematics”, 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, “Advanced Engineering Mathematics”, 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, “Advanced Engineering Mathematics”, 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, “Elementary Differential Equations”, 7th Edition, John Wiley & sons, New Delhi, 2011.

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 the course, Course Outcomes	1	13/03/23		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to UNIT I	1	16/03/23		TLM1	
3.	Matrices and rank of a matrix	1	17/03/23		TLM1	
4.	Echelon form of a matrix	1	18/03/23		TLM1	
5.	Normal form of a matrix	1	20/03/23		TLM1	
6.	Normal form of a matrix	1	23/03/23		TLM1	
7.	PAQ form	1	24/03/23		TLM1	
8.	Solution of Non-homogeneous linear system of equations	1	25/03/23		TLM1	
9.	Solution of Non-homogeneous Linear system of equations	1	27/03/23		TLM1	
10.	Solution of Homogeneous Linear system of equations	1	31/03/23		TLM1	
11.	Tutorial 1	1	01/04/23		TLM3	
12.	Solution of Homogeneous Linear system of equations	1	03/04/23		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	06/04/23		TLM1	
14.	Eigen values of a matrix	1	08/04/23		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	10/04/23		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	13/04/23		TLM1	
17.	Eigen values and Eigen vectors of a matrix.	1	15/04/23		TLM1	
18.	Properties	1	17/04/23		TLM1	
19.	Properties		20/04/23			
20.	Cayley – Hamilton Theorem.	1	21/04/23		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	24/04/23		TLM1	
22.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	27/04/23		TLM1	
23.	Tutorial 2	1	28/04/23		TLM3	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: Laplace Transforms

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.	Introduction to Unit-III	1	29/04/23		TLM1	
25.	Standard forms of Laplace Transforms.	1	01/05/23		TLM1	
26.	Linear Property, Shifting Theorem.	1	04/05/23		TLM1	
27.	Change of scale property, Multiplication by t.	1	05/05/23		TLM1	
28.	Multiplication by t.	1	06/05/23		TLM1	

II MID EXAMINATIONS (08-05-2023 TO 13-05-2023)						
29.	Division by t	1	15/05/23			TLM1
30.	Laplace transforms of derivatives.	1	18/05/23			TLM 1
31.	Laplace transforms of Integrals.	1	19/05/23			TLM1
32.	Tutorial 3	1	20/05/23			TLM3
33.	Unit step function and Dirac's delta function.	1	22/05/23			TLM1
34.	Application of Laplace Transforms.	1	25/05/23			TLM1
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to UNIT IV.	1	26/05/23		TLM1	
36.	Linear property.	1	27/05/23		TLM1	
37.	First Shifting properties.	1	29/05/23		TLM1	
38.	Inverse transforms properties	1	01/06/23		TLM1	
39.	Problems	1	02/06/23		TLM1	
40.	Inverse Laplace transform by using partial fractions.	1	03/06/23		TLM1	
41.	Inverse Laplace transform by using partial fractions.	1	05/06/23		TLM1	
42.	Inverse Laplace Transform by using Convolution theorem.	1	08/06/23		TLM1	
43.	Inverse Laplace Transform by using Convolution theorem.	1	09/06/23		TLM1	
44.	Solving of Ordinary differential equation by Laplace transform method.	1	10/06/23		TLM1	
45.	Solving of Ordinary differential equation by Laplace transform method.	1	12/06/23		TLM1	
46.	Tutorial 4	1	15/06/23		TLM3	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction to UNIT V.	1	16/06/23		TLM1	
48.	Standard forms of Z- Transform.	1	17/06/23		TLM1	
49.	Damping rule	1	19/06/23		TLM1	
50.	Shifting Rule	1	22/06/23		TLM1	
51.	Initial and final value theorems.	1	23/06/23		TLM1	
52.	Other properties	1	24/06/23		TLM1	
53.	Inverse Z – Transforms by using partial fractions.	1	26/06/23		TLM1	
54.	Inverse Z – Transform by using convolution theorem.	1	30/06/23		TLM1	
55.	Inverse Z – Transform by using convolution theorem.	1	31/06/23		TLM1	
56.	Solving of Difference equations by using Z – Transforms.	1	01/07/23		TLM1	
57.	Solving of Difference equations by using Z – Transforms.	1	03/07/23		TLM1	
58.	Revision	1	06/07/23		TLM1	
59.	Tutorial 5	1	07/07/23		TLM3	
No. of classes required to complete UNIT-V: 12				No. of classes taken:		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
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60.	Solving Simultaneous equations using Laplace Transforms	1	08/07/23		TLM2	
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II MID EXAMINATIONS (10-07-2023 TO 15-07-2023)

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	G.VIJAYA LAKSHMI	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. A. Rami Reddy

Signature				
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DEPARTMENT OF FRESHMAN ENGINEERING

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. Lakshmi V R Babu Syamala	
Course Name & Code	: Engineering Chemistry & 20FE06	
L-T-P Structure	: 3-0-0	Credits: 3
Program/Sem/Sec	: I B.Tech., CSE, II-Sem., Section-B	A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (Cos): After completion of the course, students will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications. (Apply-L3)
CO2	Apply principles of corrosion for design and effective maintenance of various equipments. (Apply-L3)
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine. (Understand-L2)
CO4	Identify the importance of liquid crystals, polymers in advanced technologies. (Understand-L2)
CO5	Apply the principles of analytical techniques in chemical analysis. (Apply-L3)

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	2	-	-	-	-	2
CO2	3	2	2	1	-	2	1	-	-	-	-	2
CO3	3	2	2	1	-	1	1	-	-	-	-	2
CO4	3	2	2	1	-	1	1	-	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	-	2
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

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

BOS APPROVED TEXT BOOKS:

- T1** Shikha Agarwal, "A Text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015
- T2** Jain, Jain, "A textbook of Engineering Chemistry", Dhanpat Rai Publishing Company, Delhi, 16th Edition, 2015.

BOS APPROVED REFERENCE BOOKS:

- R1** Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.
- R2** S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010
- R3 R4** Prasanta Rath, B. Rama Devi, Ch. Venkata Ramana Reddy, Subhendu Chakrot "Engineering Chemistry", Cengage Learning India, 1st Edition, 2019.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: ELECTRO CHEMISTRY & BATTERIES**

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 Engineering Chemistry, Course, COs, Introduction to Unit-I	1	14-03-2023		TLM1	
2.	Applications of Electro chemical Series	1	16-03-2023		TLM1	
3.	Calculation of EMF of Cell		17-03-2023		TLM1	
4.	Calomel Electrode, Nernst equation derivation	1	18-03-2023		TLM1	
5.	Glass Electrode	1	21-03-2023		TLM1	
6.	Applications of Nernst Equation-1	1	23-03-2023		TLM1	
7.	Applications of Nernst Equation-2	1	24-03-2023		TLM1	
8.	Lead-acid Battery	1	25-03-2023		TLM1	
9.	Lithium-ion Battery	1	28-03-2023		TLM1	
10.	H ₂ – O ₂ Fuel cell, Mg-Cu reserve battery	1	31-03-2023		TLM1	
11.	Revision of unit 1, Assignment & Quiz	1	01-04-2023		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

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, Examples, dry corrosion	1	04-04-2023		TLM1	
2.	corrosion by other gases and liquid metal corrosion, Pilling bed worth rule	1	06-04-2023		TLM1	
3.	Conditions for wet corrosion, hydrogen evolution, types of	1	08-04-2023		TLM1	

	wet corrosion				
4.	Mechanism-oxygen absorption,	1	11-04-2023		TLM1
5.	Galvanic Corrosion, passivity and Galvanic series	1	13-04-2023		TLM1
6.	Concentration Cell Corrosion	1	15-04-2023		TLM1
7.	Factors influencing corrosion- Nature of metal	1	18-04-2023		TLM1
8.	Factors influencing corrosion- nature of environment	1	20-04-2023		TLM1
9.	Cathodic Protection	1	21-04-2023		TLM1
10.	Electroplating & metal cladding	1	25-04-2023		TLM1
11.	Revision of unit II	1	27-04-2023		TLM1
12.	Assignment & Quiz	1	28-04-2023		TLM1
No. of classes required to complete UNIT-II: 12				No. of classes taken:	

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials	1	29-04-2023		TLM1	
2.	Gas-Phase synthesis of nanomaterials	1	02-05-2023		TLM1	
3.	Applications of nano materials	1	04-05-2023		TLM1	
4.	Materials in Electronic devices	1	05-05-2023		TLM1	
5.	Contd.. Materials in Electronic devices	1	06-05-2023		TLM1	
6.	Characteristics of Molecular motors and machines	1	16-05-2023		TLM1	
7.	Rotaxanes as artificial molecular machines	1	18-05-2023		TLM1	
8.	Catenanes as artificial molecular machines	1	19-05-2023		TLM1	
9.	Automated light powered molecular motors	1	20-05-2023		TLM1	
10.	Revision of unit III, Assignment & Quiz	1	23-05-2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV : LIQUID CRYSTALS & POLYMERS

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 of liquid crystals	1	25-05-2023		TLM1	
2.	Mechanism of working of liquid crystals & their	1	26-05-2023		TLM2	

	Applications				
3.	Introduction and types of polymerizations	2	27-05-2023 & 30-05-2023		TLM1
4.	Preparation properties and engineering applications of PMMA, Teflon	1	01-06-2023		TLM1
5.	Preparation properties and engineering applications of Polycarbonate, structure of raw, vulcanized rubber	2	02-06-2023 & 03-06-2023		TLM1
6.	Preparation properties and engineering applications of Polyurethane, Buna-S	1	06-06-2023		TLM1
7.	Conducting polymers	1	07-06-2023		TLM1
8.	Bio-degradable polymers	1	09-06-2023		TLM1
9.	Revision of unit IV	1	10-06-2023		TLM1
10.	Assignment & Quiz	1	13-06-2023		
No. of classes required to complete UNIT-IV: 12				No. of classes taken:	

UNIT-V : ANALYTICAL TECHNIQUES

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 Types of analysis	1	15-06-2023		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	2	16-06-2023 & 17-06-2023		TLM1	
3.	Strong acid vs weak base titrations.	1	20-06-2023		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	22-06-2023		TLM1	
5.	Principle of potentiometry Acid-base titration, redox titration .	2	23-06-2023		TLM1	
6.	Colorimetry, Principle determination of iron by thiocyanate as a reagent	1	24-06-2023		TLM1	
7.	Revision of unit V	1	27-06-2023		TLM1	
8.	Assignment & Quiz	1	30-06-2023			
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

CONTENTS BEYOND SYLLABUS

1.	Batteries used in mobile phones of popular companies.	2	1-07-2023 & 04-07-2023		TLM1	
2.	Polymers in industrial	2	06-07-2023		TLM1	

	applications and applications of electroplating with reference to PCBs		to 08-07-2023			
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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 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. L. V. R B. Syamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs. Usha Rani Bajjuri
 Course Name & Code : Python Programming (20CS05)
 L-T-P Structure : 3-0-0 Credits : 3
 Program/Sem/Sec : B.Tech. – CSE / II Sem / B A.Y. : 2022 – 23

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

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

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

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

TEXTBOOKS:

- T1:** Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford Publications
T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

- R1:** Gowrishankar S and Veena A, “Introduction to Python Programming”, CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK
R2: R. Nageswara Rao, “Core python programming”, Dreamtech, 2017.
R3: Y. Daniel Liang, “Revel for Introduction to Python Programming and Data Structures”, Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	1	13/03/2023			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	1	14/03/2023			
3.	Python Built-in Types, Variables, Indentation	1	16/03/2023			
4.	Input-Output Statements	1	17/03/2023			
5.	Identifiers, Keywords, Literals, Simple Programs	1	18/03/2023			
6.	Operators in Python	1	20/03/2023			
7.	Operator Precedence, Programming Examples	1	21/03/2023			
8.	Conditional Statements – if, if-else, Nested If-else	1	23/03/2023			
9.	Python Loops – While loop, while loop with else, sample programs	1	24/03/2023			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	25/03/2023			
11.	Jumping Statements – continue, break, pass	1	27/03/2023			
12.	Mathematical functions & constants, Random Number functions	1	28/03/2023			
No. of classes required to complete UNIT – I: 12				No. of classes taken:		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	List: Basics of List, Creating and Accessing Elements	1	31/03/2023			
14.	Updating Lists & Deleting Lists, Sample Programs	1	01/04/2023			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	03/04/2023			
16.	Operations on Matrices	1	04/04/2023			
17.	Built-in List Functions	1	06/04/2023			
18.	Tuples: Basics of Tuples, Creating and Deleting elements in a Tuple	1	10/04/2023			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	11/04/2023			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	13/04/2023			
21.	Sets: Basics of Sets, Operations on sets, Sample Programs	1	15/04/2023			
22.	Dictionaries: Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	17/04/2023			
23.	Dictionary Properties & Functions	1	18/04/2023			
No. of classes required to complete UNIT – II: 11				No. of classes taken:		

UNIT – III: Functions, Modular Design & Exception Handling

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.	Functions: Basics of Function, Defining and Calling a function, Sample Programs	1	20/04/2023			
25.	Types of functions, Function Arguments, Anonymous functions	1	21/04/2023			
26.	Global and Local variables, Sample Programs	1	24/04/2023			
27.	Recursion, Sample Programs	1	25/04/2023			
28.	Modular Design: Introduction to Modules, creating a Module, import statement	1	27/04/2023			
29.	from statement, Date and Time Module	1	28/04/2023			
30.	Programs on Modules	1	29/04/2023			
31.	Exception Handling: Basics of Exception, except clause, try clause	1	01/05/2023			
32.	Finally clause and User Defined Exceptions	1	02/05/2023			
No. of classes required to complete UNIT – III: 09				No. of classes taken:		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Strings: Basics of Strings, Slicing, Escape Characters	1	04/05/2023			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	1	05/05/2023			
35.	Built-in string methods	1	06/05/2023			
36.	Programs on Strings	1	08/05/2023			
37.	Regular Expressions: Using Special Characters, Regular Expression Methods	1	09/05/2023			
38.	Named Groups in Python RegEx, glob Module	1	11/05/2023			
39.	Programs on Regular Expressions	1	12/05/2023			
40.	Files: Basics of File, Creating files	1	13/05/2023			
41.	Operation on files – Read, Write and Search	1	29/05/2023			
No. of classes required to complete UNIT – IV: 09				No. of classes taken:		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	30/05/2023			
43.	Introduction to Classes	1	31/05/2023			
44.	Programming Examples	1	01/06/2023			
45.	Self-Variable, Methods	1	02/06/2023			

46.	Constructor Method	1	03/06/2023			
47.	Inheritance	1	05/06/2023			
48.	Programs on Inheritance	1	08/06/2023			
49.	Overriding Methods	1	09/06/2023			
50.	Data Hiding	1	10/06/2023			
51.	Programs on Overriding and Data Hiding	1	12/06/2023			
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
52.	Introduction to NumPy	1	13/06/2023			
53.	Introduction to Pandas	1	15/06/2023			
54.	Basic Operations using NumPy and Pandas	1	16/06/2023			

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):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. Usha Rani Bajjuri	Dr. Y.V.Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. Sudhakar

Course Name & Code : DATA STRUCTURES & 20CS03

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

Credits: 3

Program/Sem/Sec : B.Tech/II/B

A.Y.: 2022-23

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.(Understand - L2)
CO2	Apply linear data structures like stack and queue in problem solving.(Apply - L3)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.(Understand - L2)
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(Understand - L2)
CO5	Demonstrate graph traversal techniques and hashing techniques.(Understand - L2)

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

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

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	13-03-2023		TLM1	
2.	Classification of Data Structures	1	14-03-2023		TLM1	
3.	Introduction to Algorithm	1	15-03-2023		TLM1	
4.	Algorithm Analysis	2	16-03-2023 18-03-2023		TLM1	
5.	Asymptotic Notations	2	20-03-2023 21-03-2023		TLM1	
6.	List using Arrays	1	23-03-2023		TLM1	
7.	Single Linked List	3	25-03-2023 27-03-2023 28-03-2023		TLM1	
8.	Double Linked List	2	29-03-2023 31-03-2023		TLM1	
9.	Circular Linked List	2	01-04-2023 03-04-2023		TLM1	
No. of classes required to complete UNIT-I: 15				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Stacks Adt	1	04-04-2023		TLM1	
11.	Stacks Using Arrays	1	06-04-2023		TLM1	
12.	Stacks Using Linked List	1	10-04-2023		TLM1	
13.	Infix To Postfix Conversion	2	11-04-2023 12-04-2023		TLM1	
14.	Postfix Evaluation	1	13-04-2023		TLM1	
15.	Checking Balanced Parenthesis	1	15-04-2023		TLM1	
16.	Queue	1	17-04-2023		TLM1	
17.	Queue Using Array	1	18-04-2023 19-04-2023		TLM1	
18.	Queue Using Linked List	1	20-04-2023		TLM1	
19.	Circular Queue	2	24-04-2023 25-04-2023		TLM1	
20.	Deque	2	26-04-2023 27-05-2023		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT-III: SORTING TECHNIQUES

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.	Bubble sort	2	29-04-2023 01-05-2023		TLM1	
22.	Insertion Sort	2	02-05-2023 03-05-2023		TLM1	
23.	Selection Sort	2	04-05-2023 06-05-2023		TLM1	
24.	Merge Sort	2	15-05-2023 16-05-2023		TLM1	
25.	Quick Sort	2	17-05-2023		TLM1	

			18-05-2023			
26.	Heap Sort	2	20-05-2023 22-05-2023		TLM1	
27.	Comparison analysis	1	23-05-2023		TLM1	
No. of classes required to complete UNIT-III: 13				No. of classes taken:		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Introduction, Basic Concepts	2	24-05-2023 25-05-2023		TLM1	
29.	Binary Trees	1	27-05-2023		TLM1	
30.	Representation of Binary Trees	1	29-05-2023		TLM1	
31.	Tree Traversals	2	30-05-2023 31-05-2023		TLM1	
32.	Implementation	1	01-06-2023			
33.	Binary Search Trees	3	03-06-2023 05-06-2023 06-03-2023		TLM1	
34.	AVL Trees	2	07-06-2023 08-06-2023		TLM1	
35.	Operations	2	10-06-2023 12-06-2023		TLM1	
No. of classes required to complete UNIT-IV: 14				No. of classes taken:		

UNIT-V: GRAPHS & HASHING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	GRAPHS, FUNDAMENTALS	2	13-06-2023 14-06-2023		TLM1	
37.	REPRESENTATION OF GRAPHS	1	15-06-2023		TLM1	
38.	BFS	1	17-06-2023		TLM1	
39.	DFS	1	19-06-2023		TLM1	
40.	Hashing Introduction	1	20-06-2023		TLM1	
41.	Hash Table, Hash Function	1	21-06-2023		TLM1	
42.	Types of Hash Functions	1	22-06-2023		TLM1	
43.	Separate Chaining	1	24-06-2023		TLM1	
44.	Linear Probing	1	26-06-2023		TLM1	
45.	Quadratic Probing	1	27-07-2023		TLM1	
46.	Double Hashing	1	28-06-2023		TLM1	
47.	Rehashing	1	01-07-2023		TLM1	
No. of classes required to complete UNIT-V: 13				No. of classes taken:		

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

PART-C

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. A. Sudhakar	Dr. S. Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: K.RAVI KIRAN YASASWI		
Course Name & Code	: CONSTITUTION OF INDIA (20MC01)		
L-T-P Structure	: 2-0-0	Credits : 0	
Program/Sem/Sec	: B.Tech., CSE., II-Sem., B	A.Y: 2022-23	

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive, Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

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

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commission and the process and about SC, ST, OBC and women.

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	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

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

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

TEXT BOOKS:

- T1** Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi
- T2** Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

- R1** Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.
- R2** Subash Kashyap, Indian Constitution, National Book Trust.
- R3** J.A. Siwach, Dynamics of Indian Government and Politics.
- R4** D.C. Gupta, Indian Government and Politics.
- R5** H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).
- R6** J.C. Johari, Indian Government and Politics Hans.
- R7** J.Raj, Indian Government and Politics.
- R8** M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.
- R9**Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section B

UNIT-I : Introduction to Indian Constitution

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 Co-Po and Syllabus	1	13-03-2023		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	15-03-2023		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	20-03-2023		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	27-03-2023		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	03-04-2023		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	10-04-2023		TLM2	CO1	T1 / T2	
7.	Assignment -I	1	12-04-2023		TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		7			No. of classes taken:			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	17-04-2023		TLM2	CO2	T1 / T2	
9	Federalism Centre State Relationships to the Union, President Role, Power and Position	1	19-04-2023		TLM2	CO2	T1 / T2	
10	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties	1	24-04-2023		TLM2	CO2	T1 / T2	
11	Lok Sabha,Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	26-04-2023		TLM2	CO2	T1 / T2	
12	Assignment II	1	01-05-2023		TLM2	CO2	T1 / T2	
No. of classes required to complete UNIT-II		5			No. of classes taken:			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	State Government and its Administration Governor and Role	1	03-05-2023		TLM2 / TLM4	CO3	T1 / T2	
I MID EXAMINATIONS 08-05-2023 To 13-05-2023								
16	Role of Chief Ministers and Council of Ministers	1	15-05-2023		TLM2 / TLM4	CO3	T1 / T2	
17	State Secretariat Functions	1	17-05-2023		TLM2 / TLM4	CO3	T1 / T2	
18	Organisation ,Structure and Functions of State Governments	1	22-05-2023		TLM2 / TLM4	CO3	T1 / T2	
19	Assignment –III	1	24-05-2023		TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		05			No. of classes taken:			

UNIT-IV: A Local Administration

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
20	A Local Administration	1	29-05-2023		TLM2 / TLM4	CO4	T1 / T2	
21	Role and importance of local administration	1	31-05-2023		TLM2 / TLM4	CO4	T1 / T2	
22	Municipalities –Mayor and Role of Elected Representative	1	05-06-2023		TLM2 / TLM4	CO4	T1 / T2	
23	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles	1	07-06-2023		TLM2 / TLM4	CO4	T1 / T2	
24	Village level-Role of Elected and Appointed officials./Assignment-IV	1	12-06-2023		TLM2/ TLM 7	CO4	T1 / T2	
25	Assignment –IV	1	14-06-2023					
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Election Commission

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	Election Commission	1	19-06-2023		TLM2 / TLM4	CO5	T1 / T2	
26	Role of Chief Election Commissioner and Election Commissionerate	1	21-06-2023		TLM2 / TLM4	CO5	T1 / T2	
27	State Election Commission	1	26-06-2023		TLM2 / TLM4	CO5	T1 / T2	
28	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	28-06-2023		TLM2 / TLM4	CO5	T1 / T2	
29	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	03-07-2023		TLM2 / TLM4	CO5	T1 / T2	
II MID EXAMINATIONS 10-07-2023 To 15-07-2023								
No. of classes required to complete UNIT-V		05			No. of classes taken:			

Content Beyond the Syllabus

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Consumer Rights	2	05-07-2023		TLM2/ TLM5		T2/R3	
	Industrial policies							

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
TLM 7	Assignment /Quiz		

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=15
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=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
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=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+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	Programming Paradigms: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	Data Engineering: To inculcate an ability to analyze, design and implement database applications.
PSO 3	Software Engineering: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
K.Ravi Kiran Yasaswi	K.Ravi Kiran Yasaswi	Dr.D.Veeraiah	Dr.D.Veeraiah



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

Part-A

Name of Course Instructor	: Dr. Lakshmi V R Babu Syamala	
Course Name & Code	: Engineering Chemistry Lab & 20FE53	
L-T-P Structure	: 3-0-0	Credits: 1.5
Program/Sem/Sec	: I B.Tech., CSE, II-Sem., Section-B	A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: This course enables the students to analyze water samples and perform different types of volumetric titrations. It provides them with an overview of preparation of polymers and analytical techniques.

Course Outcomes: At the end of the course, the student shall be able to

CO1: Assess alkalinity of water based on the procedure given. (Understand-L2)

CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (Understand-L2)

CO3: Acquire practical knowledge related to preparation of polymers. (Understand-L2)

CO4: Exhibit skills in performing experiments based on theoretical fundamentals. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	1	-	2	2	-	-	-	-	-
CO2	2	1	-	-	-	-	-	-	-	-	-	-
CO3	2	-	1	-	-	-	-	-	-	-	-	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

BOS Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Engineering Chemistry lab	3	13-03-2023		TLM1	CO4	
2.	Introduction to volumetric analysis	3	20-03-2023		TLM1	CO4	
3.	Preparation of Bakelite (Demo Expt-1)	3	27-03-2023		TLM1	CO4	
4.	Determination of pH (Demo Expt-2)	3	03-04-2023		TLM1	CO4	
5.	Determination of amount of Na ₂ CO ₃ using standard HCl solution.	3	10-04-2023		TLM4	CO3,CO4	
6.	Estimation of Mohr's salt using potassium permanganate.	3	17-04-2023		TLM4	CO3,CO4	
7.	Estimation of Mohr's salt using potassium dichromate	3	24-04-2023		TLM4	CO2,CO4	
8.	Determination of Mg ⁺² using standard EDTA solution.	3	01-05-2023		TLM4	CO3,CO4	
9.	Determination of alkalinity of water sample.	3	15-05-2023		TLM4	CO2,CO4	
10.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	22-05-2023		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using standard NH ₄ OH solution.	3	29-05-2023		TLM4	CO1,CO4	
12.	Preparation of nylon fibres.	3	05-06-2023		TLM4	CO2,CO4	
13.	Repeat and/or Additional expt-1	3	12-06-2023		TLM4	CO2,CO4	
14.	Internal examination for lab.	3	19-06-2023		TLM4		
Total							

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks For Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day - to - Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		15 Marks

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. L. V. R. B Syamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Mrs. Usha Rani Bajjuri	
Course Name & Code	: Python Programming Lab (20CS54)	
L-T-P Structure	: 0-0-3	Credits : 1.5
Program/Sem/Sec	: B.Tech. – CSE / II Sem / B	A.Y. : 2022 – 23

PRE-REQUISITE: Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem-solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO1:	Apply building blocks of Python in solving computational problems.	Apply – Level 3
CO2:	Implement in-built data structures available in Python to solve computational problems.	Apply – Level 3
CO3:	Implement modular programming, string manipulations and Object-oriented programming in python.	Apply – Level 3
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	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
			1 – Low			2 – Medium			3 – High						

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Python IDE Installation and Basics of Python	3	3	14/03/2023	DM5
2.	Language basics and example problems	6	9	21/03/2023 28/03/2023 04/04/2023	DM5
3.	Programs on Lists	3	3	11/04/2023	DM5
4.	Programs on Tuples	3	3	18/04/2023	DM5
5.	Programs on Sets	3	3	25/04/2023	DM5
6.	Programs on Dictionaries	3	3	02/05/2023	DM5
7.	Programs on Functions and Recursion	3	3	09/05/2023	DM5
8.	Programs on Date and Time Modules, Exception Handling	3	3	30/05/2023	DM5
9.	Programs on Strings	3	3	06/06/2023	DM5
10.	Programs on Regular Expressions	3	3	13/06/2023	DM5
11.	Programs on Object-Oriented Programming	3	3	20/06/2023	DM5
12.	Programs on Python Libraries – Numpy , Pandas , Matplotlib	3	3	27/06/2023	DM5
13.	Internal Lab Exam	3	3	01/07/2023	DM4

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. Usha Rani Bajjuri	Dr. Y.V.Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				

PART-C

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. Usha Rani Bajjuri	Dr. Y.V.Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. Sudhakar

Course Name & Code : DATA STRUCTURES LAB & 20CS53

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

Credits: 1.5

Program/Sem/Sec : B.Tech/II/B

A.Y.: 2022-23

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (Apply - L3)

CO2: Implement Various Sorting Techniques. (Apply - L3)

CO3: Implement Non-Linear Data Structure such as Trees & Graphs. (Apply - L3)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

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

PART-B:**COURSE DELIVERY PLAN (LESSON PLAN):**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	List Using Arrays	3	15-03-2023		
2.	Single Linked List	3	29-03-2023		
3.	Double Linked List Circular Linked List	3	12-04-2023		
4.	<i>Stack Using Arrays</i> <i>Stack Using Linked List</i>	3	19-04-2023		
5.	<i>Queue Using Arrays</i> <i>Queue Using Linked List</i>	3	26-04-2023		
6.	Conversions	3	03-05-2023		
7.	Evaluation of Postfix, Balanced Parenthesis	3	17-05-2023		
8.	Circular Queue, Double Ended Queue	3	24-05-2023		
9.	Bubble Sort, Insertion Sort, Selection Sort	3	31-05-2023		
10.	Merge Sort, Quick Sort	3	07-06-2023		
11.	Heap Sort, Binary Tree	3	14-06-2023		
12.	Binary Search Tree Operations	3	21-06-2023		
13.	BFS,DFS	3	28-06-2023		
14.	Internal Exam	3	05-07-2023		

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. A. Sudhakar	Dr. S. Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr S Jayaprada

Course Name & Code : SHELL SCRIPTING LAB & 20CS55

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

Credits: 1

Program/Sem/Sec : B.Tech, CSE, II-Sem.,Section-B

A. Y : 2022-23

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

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

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

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

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

REFERENCE BOOKS:

- R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656
- R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. Gilberg Publisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256
- R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - B

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
1.	Module – I: Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	3	17-03-2023		DM5	
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	3	24-03-2023		DM5	
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	3	31-03-2023		DM5	
4.	Module–II: Introduction to Shell- Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments, Basic Operators	3	21-04-2023		DM5	
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	3	28-04-2023		DM5	
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	3	05-05-2023		DM5	
7.	Module – III: Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	3	12-05-2023		DM5	
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	3	02-06-2023		DM5	

9.	Commands related to inode, I/O redirection and piping, process control commands, mails.	3	09-06-2023		DM5	
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	3	16-06-2023		DM5	
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (ii) Listing your job with below normal priority (iv) Continue running your job after logging out.	3	23-06-2023		DM5	
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print file names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	3	30-06-2023		DM5	
13.	Lab Internal Exam	3	07-07-2023		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 Regulations):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and 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. D.V.Subbaiah	Dr. D. Veeraiah
Signature				



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. K. SRIDEVI

Course Name & Code : PC-II, 20FE02

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

Credits: 02

Program/Sem/Sec : CSE-C –II SEM

A.Y. : 2022-23

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

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

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
CO5	Write well-structured essays; Reports & Résumé.	L3

UNIT-I

Fabric of Change - 'H.G. Wells and the Uncertainties of Progress–Peter J. Bowler';

Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary:

Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting;

Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';

Reading: Global Comprehension; Detailed Comprehension; Grammar &

Vocabulary: Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays

using suitable claims and evidences.

UNIT-III

'Homi Jahangir Bhabha'- Grammar & Vocabulary: Words often confused; Common Errors; Writing: Incident & Investigation Reports.

UNIT-IV

'Jagadish Chandra Bose' - Grammar & Vocabulary: Use of antonyms; Correction of Sentences; Writing: Dialogue Writing.

UNIT-V

'Prafulla Chandra Ray' - Grammar & Vocabulary: Analogy; Sentence Completion; Writing: Writing a Résumé

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

TEXTBOOKS:

- T1** Prabhavati. Y & etal , "English All Round –Communication Skills for Undergraduate Learners" ,Orient Black Swan, Hyderabad, 2019
- T2** "The Great Indian Scientists" published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

- R1** Swan, M., "Practical English Usage", Oxford University Press, 2016.
- R2** Kumar, Sand Latha, P, "Communication Skills", Oxford University Press, 2018.
- R3** Rizvi Ashraf M., "Effective Technical Communication", Tata Mc Graw Hill, NewDelhi, 2008.
- R4** Baradwaj Kumkum, "Professional Communication", I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.
- R5** Wood, F. T., "Remedial English Grammar" , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	13-03-2023		TLM2	
2.	Fabric of Change -‘H.G. Wells and the Uncertainties of Progress– Peter J. Bowler’	02	15-03-2023 17-03-2023		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	20-03-2023		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	24-03-2023		TLM2	
5.	Adjectives and adverbs	01	27-03-2023		TLM2	
6.	Degrees of Comparison	01	29-03-2023		TLM2	
7.	Writing: Information Transfer.	02	31-03-2023 03-04-2023		TLM2 TLM6	
No. of classes required to complete UNIT-I: 09				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Tools for Life - ‘Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far’;	02	10-04-2023 12-04-2023		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	17-04-2023		TLM2	
10.	Active & Passive Voice	01	19-04-2023		TLM2	
11.	Idioms & Phrases	02	21-04-2023 24-04-2023		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	02	26-04-2023 28-04-2023		TLM2 TLM6	
No. of classes required to complete UNIT-II: 08				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
13.	‘Homi Jahangir Bhabha’	02	01-05-2023 03-05-2023		TLM2 TLM6	
14.	Words often confused	01	05-05-2023		TLM2	
15.	Common Errors	01	15-05-2023		TLM2	
16.	Report Writing - Types & Formats	01	17-05-2023		TLM2	
17.	Incident and Investigation Reports	02	19-05-2023 22-05-2023		TLM2 TLM6	
No. of classes required to complete UNIT-III: 07				No. of classes taken:		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Jagadish Chandra Bose	03	24-05-2023 26-05-2023 31-05-2023		TLM2 TLM2	
19.	Use of antonyms	01	02-06-2023		TLM2	
20.	Correction of Sentences	01	05-06-2023		TLM2	
21.	Formal and Informal dialogues	01	07-06-2023		TLM2	
22.	Dialogue Writing.	02	09-06-2023 12-06-2023		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 08				No. of classes taken:		

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Prafulla Chandra Ray	03	14-06-2023 16-06-2023 19-06-2023		TLM2	
24.	Analogy	01	21-06-2023		TLM2	
25.	Sentence Completion	01	23-06-2023		TLM2	
26.	Resume - Formats	02	26-06-2023 28-06-2023		TLM2	
27.	Writing a Résumé	03	03-07-2023 05-07-2023 07-07-2023		TLM2 TLM6	
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 (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	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	K. Sridevi	Dr. B. Samrajya Lakshmi	Dr. B. Samrajya Lakshmi	Dr. A. Ramireddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM/SEM/SEC	: I B. Tech., II-Sem., CSE C
ACADEMIC YEAR	: 2022-23
COURSE NAME & CODE	: Linear algebra & Transformation Techniques & 20FE04
L-T-P STRUCTURE	: 3-1-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: D. VIJAYA KUMAR
COURSE COORDINATOR	: Dr. K. Jhansi Rani
PRE-REQUISITES	: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

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

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (Apply L3)

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

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

TEXTBOOKS:

T1 Dr. B.S. Grewal, “Higher Engineering Mathematics”, 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, “Higher Engineering Mathematics”, 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, “Advanced Engineering Mathematics”, 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, “Advanced Engineering Mathematics”, 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, “Elementary Differential Equations”, 7th Edition, John Wiley & sons, New Delhi, 2011.

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 the course, Course Outcomes	1	13/03/23		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to UNIT I	1	14/03/23		TLM1	
3.	Matrices and rank of a matrix	1	17/03/23		TLM1	
4.	Echelon form of a matrix	1	18/03/23		TLM1	
5.	Normal form of a matrix	1	20/03/23		TLM1	
6.	Normal form of a matrix	1	21/03/23		TLM1	
7.	PAQ form	1	24/03/23		TLM1	
8.	Solution of Non-homogeneous linear system of equations	1	25/03/23		TLM1	
9.	Solution of Non-homogeneous Linear system of equations	1	27/03/23		TLM1	
10.	Solution of Homogeneous Linear system of equations	1	28/03/23		TLM1	
11.	Tutorial 1	1	31/03/23		TLM3	
12.	Solution of Homogeneous Linear system of equations	1	01/04/23		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	03/04/23		TLM1	
14.	Eigen values of a matrix	1	04/04/23		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	10/04/23		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	11/04/23		TLM1	
17.	Eigen values and Eigen vectors of a matrix.	1	15/04/23		TLM1	
18.	Properties	1	17/04/23		TLM1	
19.	Properties		18/04/23			
20.	Cayley – Hamilton Theorem.	1	21/04/23		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	24/04/23		TLM1	
22.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	25/04/23		TLM1	
23.	Tutorial 2	1	28/04/23		TLM3	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: Laplace Transforms

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.	Introduction to Unit-III	1	29/04/23		TLM1	
25.	Standard forms of Laplace Transforms.	1	01/05/23		TLM1	
26.	Linear Property, Shifting Theorem.	1	02/05/23		TLM1	
27.	Change of scale property, Multiplication by t.	1	05/05/23		TLM1	
28.	Multiplication by t.	1	06/05/23		TLM1	

I MID EXAMINATIONS (08-05-2023 TO 13-05-2023)						
29.	Division by t	1	15/05/23			TLM1
30.	Laplace transforms of derivatives.	1	16/05/23			TLM 1
31.	Laplace transforms of Integrals.	1	19/05/23			TLM1
32.	Tutorial 3	1	20/05/23			TLM3
33.	Unit step function and Dirac's delta function.	1	22/05/23			TLM1
34.	Application of Laplace Transforms.	1	23/05/23			TLM1
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to UNIT IV.	1	26/05/23		TLM1	
36.	Linear property.	1	27/05/23		TLM1	
37.	First Shifting properties.	1	29/05/23		TLM1	
38.	Inverse transforms properties	1	30/05/23		TLM1	
39.	Problems	1	30/05/23		TLM1	
40.	Inverse Laplace transform by using partial fractions.	1	02/06/23		TLM1	
41.	Inverse Laplace transform by using partial fractions.	1	03/06/23		TLM1	
42.	Inverse Laplace Transform by using Convolution theorem.	1	05/06/23		TLM1	
43.	Inverse Laplace Transform by using Convolution theorem.	1	06/06/23		TLM1	
44.	Solving of Ordinary differential equation by Laplace transform method.	1	09/06/23		TLM1	
45.	Solving of Ordinary differential equation by Laplace transform method.	1	10/06/23		TLM1	
46.	Tutorial 4	1	12/06/23		TLM3	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction to UNIT V.	1	13/06/23		TLM1	
48.	Standard forms of Z- Transform.	1	16/06/23		TLM1	
49.	Damping rule	1	17/06/23		TLM1	
50.	Shifting Rule	1	19/06/23		TLM1	
51.	Initial and final value theorems.	1	23/06/23		TLM1	
52.	Other properties	1	24/06/23		TLM1	
53.	Inverse Z – Transforms by using partial fractions.	1	26/06/23		TLM1	
54.	Inverse Z – Transform by using convolution theorem.	1	27/06/23		TLM1	
55.	Solving of Difference equations by using Z – Transforms.	1	30/06/23		TLM1	
56.	Solving of Difference equations by using Z – Transforms.	1	01/07/23		TLM1	
57.	Revision	1	03/07/23		TLM1	
58.	Tutorial 5	1	04/07/23		TLM3	
No. of classes required to complete UNIT-V: 12				No. of classes taken:		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
59.	Solving Simultaneous equations using Laplace Transforms	2	07/07/23 08/07/23		TLM2	

II MID EXAMINATIONS (10-07-2023 TO 15-07-2023)

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	D. VIJAYA KUMAR	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. A. Rami Reddy
Signature				



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DEPARTMENT OF FRESHMAN ENGINEERING

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. Lakshmi V R Babu Syamala	
Course Name & Code	: Engineering Chemistry & 20FE06	
L-T-P Structure	: 3-0-0	Credits: 3
Program/Sem/Sec	: I B.Tech., CSE, II-Sem., Section-C	A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (Cos): After completion of the course, students will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications. (Apply-L3)
CO2	Apply principles of corrosion for design and effective maintenance of various equipments. (Apply-L3)
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine. (Understand-L2)
CO4	Identify the importance of liquid crystals, polymers in advanced technologies. (Understand-L2)
CO5	Apply the principles of analytical techniques in chemical analysis. (Apply-L3)

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	2	-	-	-	-	2
CO2	3	2	2	1	-	2	1	-	-	-	-	2
CO3	3	2	2	1	-	1	1	-	-	-	-	2
CO4	3	2	2	1	-	1	1	-	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	-	2
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

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

BOS APPROVED TEXT BOOKS:

- T1** Shikha Agarwal, "A Text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015
- T2** Jain, Jain, "A textbook of Engineering Chemistry", Dhanpat Rai Publishing Company, Delhi, 16th Edition, 2015.

BOS APPROVED REFERENCE BOOKS:

- R1** Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.
- R2** S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010
- R3 R4** Prasanta Rath, B. Rama Devi, Ch. Venkata Ramana Reddy, Subhendu Chakrot "Engineering Chemistry", Cengage Learning India, 1st Edition, 2019.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: ELECTRO CHEMISTRY & BATTERIES**

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 Engineering Chemistry, Course, COs, Introduction to Unit-I	1	14-03-2023		TLM1	
2.	Applications of Electro chemical Series	1	15-03-2023		TLM1	
3.	Calculation of EMF of Cell		16-03-2023		TLM1	
4.	Calomel Electrode, Nernst equation derivation	1	17-03-2023		TLM1	
5.	Glass Electrode	1	21-03-2023		TLM1	
6.	Applications of Nernst Equation-1	1	23-03-2023		TLM1	
7.	Applications of Nernst Equation-2	1	24-03-2023		TLM1	
8.	Lead-acid Battery	1	28-03-2023		TLM1	
9.	Lithium-ion Battery	1	29-03-2023		TLM1	
10.	H ₂ – O ₂ Fuel cell, Mg-Cu reserve battery	1	31-03-2023		TLM1	
11.	Revision of unit 1, Assignment & Quiz	1	04-04-2023		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

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, Examples, dry corrosion	1	06-04-2023		TLM1	
2.	corrosion by other gases and liquid metal corrosion, Pilling bed worth rule	1	11-04-2023		TLM1	
3.	Conditions for wet corrosion, hydrogen evolution, types of	1	12-04-2023		TLM1	

	wet corrosion				
4.	Mechanism-oxygen absorption,	1	13-04-2023		TLM1
5.	Galvanic Corrosion, passivity and Galvanic series	1	18-04-2023		TLM1
6.	Concentration Cell Corrosion	1	19-04-2023		TLM1
7.	Factors influencing corrosion- Nature of metal	1	20-04-2023		TLM1
8.	Factors influencing corrosion- nature of environment	1	21-04-2023		TLM1
9.	Cathodic Protection	1	25-04-2023		TLM1
10.	Electroplating & metal cladding	1	26-04-2023		TLM1
11.	Revision of unit II	1	27-04-2023		TLM1
12.	Assignment & Quiz	1	28-04-2023		TLM1
No. of classes required to complete UNIT-II: 12				No. of classes taken:	

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials	1	02-05-2023		TLM1	
2.	Gas-Phase synthesis of nanomaterials	1	03-05-2023		TLM1	
3.	Applications of nano materials	1	04-05-2023		TLM1	
4.	Materials in Electronic devices	1	05-05-2023		TLM1	
5.	Contd.. Materials in Electronic devices	1	16-05-2023		TLM1	
6.	Characteristics of Molecular motors and machines	1	17-05-2023		TLM1	
7.	Rotaxanes as artificial molecular machines	1	18-05-2023		TLM1	
8.	Catenanes as artificial molecular machines	1	19-05-2023		TLM1	
9.	Automated light powered molecular motors	1	23-05-2023		TLM1	
10.	Revision of unit III, Assignment & Quiz	1	24-05-2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV : LIQUID CRYSTALS & POLYMERS

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 of liquid crystals	1	25-05-2023		TLM1	
2.	Mechanism of working of liquid crystals & their	1	26-05-2023		TLM2	

	Applications				
3.	Introduction and types of polymerizations	2	30-05-2023 & 31-05-2023		TLM1
4.	Preparation properties and engineering applications of PMMA, Teflon	1	01-06-2023		TLM1
5.	Preparation properties and engineering applications of Polycarbonate, structure of raw, vulcanized rubber	2	02-06-2023 & 06-06-2023		TLM1
6.	Preparation properties and engineering applications of Polyurethane, Buna-S	1	07-06-2023		TLM1
7.	Conducting polymers	1	08-06-2023		TLM1
8.	Bio-degradable polymers	1	09-06-2023		TLM1
9.	Revision of unit IV	1	13-06-2023		TLM1
10.	Assignment & Quiz	1	14-06-2023		
No. of classes required to complete UNIT-IV: 12				No. of classes taken:	

UNIT-V : ANALYTICAL TECHNIQUES

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 Types of analysis	1	15-06-2023		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	2	16-06-2023 & 20-06-2023		TLM1	
3.	Strong acid vs weak base titrations.	1	21-06-2023		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	22-06-2023		TLM1	
5.	Principle of potentiometry Acid-base titration, redox titration .	2	23-06-2023		TLM1	
6.	Colorimetry, Principle determination of iron by thiocyanate as a reagent	1	27-06-2023		TLM1	
7.	Revision of unit V	1	28-06-2023		TLM1	
8.	Assignment & Quiz	1	30-06-2023			
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

CONTENTS BEYOND SYLLABUS

1.	Batteries used in mobile phones of popular companies.	2	04-07-2023 & 05-07-2023		TLM1	
2.	Polymers in industrial	2	06-07-2023		TLM1	

	applications and applications of electroplating with reference to PCBs		& 07-07-2023			
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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 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. L. V. R B. Syamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SRINIVASARAO

Course Name & Code : DATA STRUCTURES & 20CS03

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

Credits: 3

Program/Sem/Sec : B.Tech. /II/C-sec

A.Y.: 2022-23

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVE (CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations. (Understand - L2)
CO2	Apply linear data structures like stack and queue in problem solving. (Apply - L3)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time. (Understand - L2)
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees. (Understand - L2)
CO5	Demonstrate graph traversal techniques and hashing techniques. (Understand - L2)

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

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

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

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein & Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2nd edition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Algorithm Analysis & Introduction to arrays and Abstract Data Type (ADT)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
1.	Introduction to Data Structures	1	13-03-2023		TLM1	CO1	T1/T2	
2.	Classification of Data Structures	1	14-03-2023		TLM1	CO1	T1/T2	
3.	Introduction to Algorithm	1	15-03-2023		TLM1	CO1	T1/T2	
4.	Algorithm Analysis	2	17-03-2023 18-03-2023		TLM1	CO1	T1/T2	
5.	Asymptotic Notations	1	20-03-2023		TLM1	CO1	T1/T2	
6.	List using Arrays	1	21-03-2023		TLM1	CO1	T1/T2	
7.	Single Linked List	3	24-03-2023 25-03-2023 27-03-2023		TLM1	CO1	T1/T2	
8.	Double Linked List & Assignment-1	3	28-03-2023 29-03-2023 31-03-2023		TLM1 TLM7	CO1	T1/T2	
9.	Circular Linked List	2	01-04-2023 03-04-2023		TLM1	CO1	T1/T2	
No. of classes required to complete UNIT-I: 15				No. of classes taken:				

UNIT-II: Stacks & Queues

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
10.	Stacks ADT	1	04-04-2023		TLM2	CO2	T1/T2	
11.	Stacks Using Arrays	1	08-04-2023		TLM1	CO2	T1/T2	
12.	Stacks Using Linked List	1	10-04-2023		TLM1	CO2	T1/T2	
13.	Infix To Postfix Conversion	2	11-04-2023 12-04-2023		TLM1	CO2	T1/T2	
14.	Postfix Evaluation	1	15-04-2023		TLM1	CO2	T1/T2	
15.	Checking Balanced Parenthesis, Queue	1	17-04-2023		TLM1	CO2	T1/T2	
16.	Queue Using Array & Linked List	2	18-04-2023 19-04-2023		TLM1	CO2	T1/T2	
17.	Circular Queue	1	21-04-2023		TLM1	CO2	T1/T2	
18.	Deque & Assignment-2	1	24-04-2023		TLM1 TLM7	CO2	T1/T2	
No. of classes required to complete UNIT-II: 11				No. of classes taken:				

UNIT-III: Sorting Techniques

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
19.	Bubble sort	1	25-04-2023		TLM2	CO3	T1/T2	
20.	Insertion Sort	1	26-04-2023		TLM1	CO3	T1/T2	
21.	Selection Sort	1	28-04-2023		TLM1	CO3	T1/T2	
22.	Merge Sort	2	29-04-2023 01-05-2023		TLM1	CO3	T1/T2	
23.	Quick Sort	2	02-05-2023 03-05-2023		TLM1	CO3	T1/T2	
24.	Heap Sort & Assignment-3	2	05-05-2023 06-05-2023		TLM1 TLM7	CO3	T1/T2	
No. of classes required to complete UNIT-III: 09				No. of classes taken:				

UNIT-IV: Trees

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
25.	Introduction to Trees	1	15-05-2023		TLM1	CO4	T1/T2	
26.	Binary Trees, Tree Traversals	2	16-05-2023 17-05-2023		TLM1	CO4	T1/T2	
27.	Binary Trees Implementation	2	19-05-2023 20-05-2023		TLM2	CO4	T1/T2	
28.	Binary Search Trees	2	22-05-2023 23-05-2023		TLM1	CO4	T1/T2	
29.	AVL Trees	2	24-05-2023 26-05-2023		TLM1	CO4	T1/T2	
30.	Operations & Examples, Assignment-4	2	27-05-2023 29-05-2023		TLM1 TLM7	CO4	T1/T2	
No. of classes required to complete UNIT-IV:11				No. of classes taken:				

UNIT-V: Graphs & Hashing Techniques

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
31.	Graphs, Fundamentals	1	30-05-2023		TLM1	CO5	T1/T2	
32.	Representation of Graphs	1	31-05-2023		TLM1	CO5	T1/T2	
33.	BFS	2	02-06-2023 03-06-2023		TLM1	CO5	T1/T2	
34.	DFS	2	05-06-2023 06-06-2023		TLM1	CO5	T1/T2	
35.	Hashing Introduction	1	07-06-2023		TLM1	CO5	T1/T2	
36.	Hash function, separate Chaining	2	09-06-2023 10-06-2023		TLM1	CO5	T1/T2	
37.	Linear & Quadratic Probing	2	12-06-2023 13-06-2023		TLM1	CO5	T1/T2	
38.	Double & Rehashing	1	14-06-2023		TLM2	CO5	T1/T2	
39.	Revision & Assignment-5	1	16-06-2023		TLM1 TLM7	CO5	T1/T2	
40.	Revision	1	17-06-2023		TLM1	CO5	T1/T2	
No. of classes required to complete UNIT-V:14				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
TLM7	Assignment/Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=15
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=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max (M1, M2) + 25% of Min (M1, M2)	M=15
Quiz Marks =75% of Max (Q1, Q2) +25% of Min (Q1, Q2)	B=10
Cumulative Internal Examination (CIE): A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Shaik Johny Basha
 Course Name & Code : Python Programming (20CS05)
 L-T-P Structure : 3-0-0 Credits : 3
 Program/Sem/Sec : B.Tech. – CSE / II Sem / C A.Y. : 2022 – 23

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

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

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

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

TEXTBOOKS:

- T1:** Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford Publications
T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

- R1:** Gowrishankar S and Veena A, “Introduction to Python Programming”, CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK
R2: R. Nageswara Rao, “Core python programming”, Dreamtech, 2017.
R3: Y. Daniel Liang, “Revel for Introduction to Python Programming and Data Structures”, Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	2	13/03/23 15/03/23			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	2	16/03/23 17/03/23			
3.	Python Built-in Types, Variables, Indentation	1	18/03/23			
4.	Input-Output Statements	1	20/03/23			
5.	Identifiers, Keywords, Literals, Simple Programs	1	23/03/23			
6.	Operators in Python	2	24/03/23 25/03/23			
7.	Operator Precedence, Programming Examples	1	27/03/23			
8.	Conditional Statements – if, if-else, Nested If-else	1	29/03/23			
9.	Python Loops – While loop, while loop with else, sample programs	1	31/03/23			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	01/04/23			
11.	Jumping Statements – continue, break, pass	1	03/04/23			
12.	Mathematical functions & constants, Random Number functions	2	06/04/23 08/04/23			
No. of classes required to complete UNIT – I: 16				No. of classes taken:		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	List: Basics of List, Creating and Accessing Elements	1	10/04/23			
14.	Updating Lists & Deleting Lists, Sample Programs	1	12/04/23			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	13/04/23			
16.	Operations on Matrices	1	15/04/23			
17.	Built-in List Functions	1	17/04/23			
18.	Tuples: Basics of Tuples, Creating and Deleting elements in a Tuple	1	19/04/23			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	20/04/23			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	21/04/23			
21.	Sets: Basics of Sets, Operations on sets, Sample Programs	1	24/04/23			
22.	Dictionaries: Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	26/04/23			
23.	Dictionary Properties & Functions	1	27/04/23			
No. of classes required to complete UNIT – II: 11				No. of classes taken:		

UNIT – III: Functions, Modular Design & Exception Handling

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.	Functions: Basics of Function, Defining and Calling a function, Sample Programs	1	28/04/23			
25.	Types of functions, Function Arguments, Anonymous functions	1	29/04/23			
26.	Global and Local variables, Sample Programs	1	01/05/23			
27.	Recursion, Sample Programs	1	03/05/23			
28.	Modular Design: Introduction to Modules, creating a Module, import statement	1	04/05/23			
29.	from statement, Date and Time Module	1	05/05/23			
30.	Programs on Modules	1	06/05/23			
31.	Exception Handling: Basics of Exception, except clause, try clause	2	15/05/23 17/05/23			
32.	Finally clause and User Defined Exceptions	2	18/05/23 19/05/23			
No. of classes required to complete UNIT – III: 11				No. of classes taken:		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Strings: Basics of Strings, Slicing, Escape Characters	2	20/05/23 22/05/23			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	2	24/05/23 25/05/23			
35.	Built-in string methods	2	26/05/23 27/05/23			
36.	Programs on Strings	1	30/05/23			
37.	Regular Expressions: Using Special Characters, Regular Expression Methods	1	31/05/23			
38.	Named Groups in Python RegEx, glob Module	1	01/06/23			
39.	Programs on Regular Expressions	1	02/06/23			
40.	Files: Basics of File, Creating files	1	03/06/23			
41.	Operation on files – Read, Write and Search	1	05/06/23			
No. of classes required to complete UNIT – IV: 12				No. of classes taken:		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	07/06/23			
43.	Introduction to Classes	2	08/06/23 09/06/23			
44.	Programming Examples	1	10/06/23 12/06/23			
45.	Self-Variable, Methods	1	14/06/23 15/06/23			

46.	Constructor Method	1	16/06/23			
47.	Inheritance	2	17/06/23 19/06/23			
48.	Programs on Inheritance	2	21/06/23 22/06/23			
49.	Overriding Methods	1	23/06/23			
50.	Data Hiding	1	24/06/23			
51.	Programs on Overriding	1	26/06/23			
52.	Programs on Data Hiding	2	28/06/23 30/06/23			
No. of classes required to complete UNIT - V: 15				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
53.	Introduction to NumPy	2	01/07/23 03/07/23			
54.	Introduction to Pandas	2	05/07/23 06/07/23			
55.	Basic Operations using NumPy and Pandas	2	07/07/23 08/07/23			

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):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Shaik Johny Basha	Dr. Y. V. Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. D. Veeraiah	
Course Name & Code	: Constitution of India (20MC01)	
L-T-P Structure	: 2-0-0	Credits : 0
Program/Sem/Sec	: B.Tech. – CSE / II Sem / C	A.Y. : 2022 – 23

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVE (CEOs):

- To enable the student to understand the importance of the constitution
- To understand the structure of Executive, Legislature and Judiciary
- To Understand Philosophy of fundamental rights and duties
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

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

CO1:	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO2:	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister, and Judicial System.
CO3:	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO4:	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO5:	Learn about Election Commission and the process and about SC, ST, OBC, and Women.

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

TEXTBOOKS:

T1: Dr. B. R. Ambedkar, The Constitution of India, General Press First edition 2020., New Delhi

T2: Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

- R1:** Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.
- R2:** Subash Kashyap, Indian Constitution, National Book Trust.
- R3:** J.A. Siwach, Dynamics of Indian Government and Politics.
- R4:** D.C. Gupta, Indian Government and Politics.
- R5:** H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).
- R6:** J.C. Johari, Indian Government and Politics Hans.
- R7:** J.Raj, Indian Government and Politics.
- R8:** M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.
- R9:** Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E-RESOURCES:

- ER1:** <https://www.nptel.ac.in/courses/109104074/8>
- ER2:** <https://www.nptel.ac.in/courses/109104045>
- ER3:** <https://www.nptel.ac.in/courses/101104065>
- ER4:** <https://www.hss.iitb.ac.in/en/lecture-details>
- ER5:** <https://www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution>

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT – I: Introduction to Indian Constitution**

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 Co-Po and Syllabus	1	14/03/23		TLM2	
2.	Constitution meaning and the term	1	17/03/23		TLM2	
3.	Sources and History of Indian Constitution	1	21/03/23		TLM2	
4.	Features-Citizenship, Preamble	1	24/03/23		TLM2	
5.	Fundamental Rights and Duties	1	28/03/23		TLM2	
6.	Directive Principles of State Policy	1	31/03/23		TLM2	
No. of classes required to complete UNIT – I: 06				No. of classes taken:		

UNIT – II: Union Government and its Administration Structure of the Indian Union

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.	Union Government structure in India	1	04/04/23		TLM2	
8.	Federalism Centre State Relationships to the Union, President Role, Power, and Position	1	11/04/23		TLM2	
9.	Prime Minister (PM) and Council of Ministers, cabinet and Central Secretariat Powers and duties	2	18/04/23 21/04/23		TLM2	
10.	Lok Sabha, Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	25/04/23		TLM2	
No. of classes required to complete UNIT – II: 05				No. of classes taken:		

UNIT – III: State Government and its Administration Governor

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.	State Government and its Administration Governor and Role	2	28/04/23 02/05/23		TLM2	
12.	Role of Chief Ministers and Council of Ministers	2	05/05/23 16/05/23		TLM2	
13.	State Secretariat Functions	1	19/05/23		TLM2	
14.	Organization, Structure and Functions of State Governments	1	23/05/23		TLM2	
No. of classes required to complete UNIT – III: 06				No. of classes taken:		

UNIT – IV: A Local Administration

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.	A Local Administration	1	26/05/23		TLM2	
16.	Role and importance of local administration	1	30/05/23		TLM2	
17.	Municipalities –Mayor and Role of Elected Representative	1	02/06/23		TLM2	
18.	Functions of Panchayati Raj Institution, Zilla Panchayats, Elected Official and their roles	2	06/06/23 09/06/23		TLM2	
19.	Village level-Role of Elected and Appointed officials.	1	13/06/23		TLM2	
No. of classes required to complete UNIT – IV: 06				No. of classes taken:		

UNIT – V: Election Commission

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.	Election Commission	1	16/06/23		TLM2	
21.	Role of Chief Election Commissioner and Election Commissionerate	2	20/06/23 23/06/23		TLM2	
22.	State Election Commission	1	27/06/23		TLM2	
23.	Functions and Commissions for the Welfare of SC/ST/OBC and Women	1	30/06/23		TLM2	
24.	Functions and Commissions for the Welfare of SC/ST/OBC and Women	1	04/07/23		TLM2	
No. of classes required to complete UNIT – V: 06				No. of classes taken:		

Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Consumer Rights and Industrial policies	1	07/07/23		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 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):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. D. Veeraiah	Dr. D. Veeraiah	Dr. D. Veeraiah	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

Part-A

Name of Course Instructor	: Dr. Lakshmi V R Babu Syamala	
Course Name & Code	: Engineering Chemistry Lab & 20FE53	
L-T-P Structure	: 3-0-0	Credits: 1.5
Program/Sem/Sec	: I B.Tech., CSE, II-Sem., Section-C	A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: This course enables the students to analyze water samples and perform different types of volumetric titrations. It provides them with an overview of preparation of polymers and analytical techniques.

Course Outcomes: At the end of the course, the student shall be able to

CO1: Assess alkalinity of water based on the procedure given. (Understand-L2)

CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (Understand-L2)

CO3: Acquire practical knowledge related to preparation of polymers. (Understand-L2)

CO4: Exhibit skills in performing experiments based on theoretical fundamentals. (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	1	-	2	2	-	-	-	-	-
CO2	2	1	-	-	-	-	-	-	-	-	-	-
CO3	2	-	1	-	-	-	-	-	-	-	-	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-
1 = Slight (Low)			2 = Moderate (Medium)					3 = Substantial (High)				

BOS Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Engineering Chemistry lab	3	13-03-2023		TLM1	CO4	
2.	Introduction to volumetric analysis	3	20-03-2023		TLM1	CO4	
3.	Preparation of Bakelite (Demo Expt-1)	3	27-03-2023		TLM1	CO4	
4.	Determination of pH (Demo Expt-2)	3	03-04-2023		TLM1	CO4	
5.	Determination of amount of Na ₂ CO ₃ using standard HCl solution.	3	10-04-2023		TLM4	CO3,CO4	
6.	Estimation of Mohr's salt using potassium permanganate.	3	17-04-2023		TLM4	CO3,CO4	
7.	Estimation of Mohr's salt using potassium dichromate	3	24-04-2023		TLM4	CO2,CO4	
8.	Determination of Mg ⁺² using standard EDTA solution.	3	01-05-2023		TLM4	CO3,CO4	
9.	Determination of alkalinity of water sample.	3	15-05-2023		TLM4	CO2,CO4	
10.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	22-05-2023		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using standard NH ₄ OH solution.	3	29-05-2023		TLM4	CO1,CO4	
12.	Preparation of nylon fibres.	3	05-06-2023		TLM4	CO2,CO4	
13.	Repeat and/or Additional expt-1	3	12-06-2023		TLM4	CO2,CO4	
14.	Internal examination for lab.	3	19-06-2023		TLM4		
Total							

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks For Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day - to - Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		15 Marks

PROGRAMME OUTCOMES (POs):

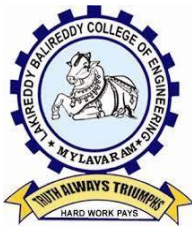
Engineering Graduates will be able to:

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. L. V. R. B Syamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : N. Srinivas Rao /A. Sudhakar / T.N.V.S Praveen
Course Name & Code : DATA STRUCTURES LAB & 20CS53
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech/II/C-Sec. A.Y.: 2022-23

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques

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

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)

CO2: Implement Various Sorting Techniques. (**Apply - L3**)

CO3: Implement Non-Linear Data Structure such as Trees & Graphs. (**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		1								3		
CO2		2	1		1								3		
CO3		2	1		1								3		
CO4								2	2	2					

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

PART-B:**COURSE DELIVERY PLAN (LESSON PLAN):**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign
1.	Introduction & List using Arrays	3	16-03-2023		TLM4	CO1	
2.	Linked List Programs	12	23-03-2023 06-04-2023 13-04-2023 20-04-2023		TLM4	CO1	
3.	Stack, Queue Using Arrays, Linked List	6	27-04-2023 04-05-2023		TLM4	CO1	
4.	Infix to Postfix, Evaluation of Postfix Expression	3	18-05-2023		TLM4	CO1	
5.	Circular Queue Double Ended Queue	3	25-05-2023		TLM4	CO1	
6.	Bubble sort Selection sort Insertion sort	3	01-06-2023		TLM4	CO2	
7.	Merge sort Quick sort	3	08-06-2023		TLM4	CO2	
8.	Heap sort Binary Tree	3	15-06-2023		TLM4	CO2 CO3	
9.	Binary Search Tree	3	22-06-2023		TLM4	CO3	
10.	BFS, DFS	3	06-07-2023		TLM4	CO3	
11.	Lab Internal Exam	3	17-07-2023		TLM7	-	

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
TLM7	Assignment/Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Mr. Shaik Johny Basha / Mr. M.R.K. Raju / Ms. T. Vineetha	
Course Name & Code	: Python Programming Lab (20CS54)	
L-T-P Structure	: 0-0-3	Credits : 1.5
Program/Sem/Sec	: B.Tech. – CSE / II Sem / C	A.Y. : 2022 – 23

PRE-REQUISITE: Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO1:	Apply building blocks of Python in solving computational problems.	Apply – Level 3
CO2:	Implement in-built data structures available in Python to solve computational problems.	Apply – Level 3
CO3:	Implement modular programming, string manipulations and Object-oriented programming in python.	Apply – Level 3
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	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
			1 – Low			2 – Medium			3 – High						

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Python IDE Installation and Basics of Python	3			DM5
2.	Language basics and example problems	6			DM5
3.	Programs on Lists	3			DM5
4.	Programs on Tuples	3			DM5
5.	Programs on Sets	3			DM5
6.	Programs on Dictionaries	3			DM5
7.	Programs on Functions and Recursion	3			DM5
8.	Programs on Date and Time Modules, Exception Handling	3			DM5
9.	Programs on Strings	3			DM5
10.	Programs on Regular Expressions	3			DM5
11.	Programs on Object-Oriented Programming	3			DM5
12.	Programs on Python Libraries – Numpy , Pandas , Matplotlib	3			DM5
13.	Internal Lab Exam	3			DM4

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Shaik Johnny Basha	Dr. Y. V. Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				

PART-C

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Shaik Johny Basha	Dr. Y. V. Bhaskar Reddy	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Ms. P. SARALA

Course Name & Code : SHELL SCRIPTING LAB & 20CS55

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

Credits: 1

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

A. Y : 2022-23

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

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

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

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

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

REFERENCE BOOKS:

- R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656
- R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. Gilberg Publisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256
- R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

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	HOD Sign
1.	Module – I: Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	14-03-2023		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	21-03-2023		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	28-03-2023		
4.	Module–II: Introduction to Shell- Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments, Basic Operators	2	04-04-2023		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	11-04-2023		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	18-04-2023		
7.	Module – III: Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	25-04-2023		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	02-05-2023		

9.	Commands related to inode, I/O redirection and piping, process control commands, mails.	2	16-05-2023		
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	23-05-2023 30-05-2023 06-06-2023		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	13-06-2023 20-06-2023		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	27-06-2023		
13.	Lab Internal Exam	2	04-07-2023		

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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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. S.Jayaprada	Dr. D.V.Subbaiah	Dr. D. Veeraiah
Signature				



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CSE (AI & ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: Y.P.C.S. Anil Kumar

Course Name & Code : Linear algebra & Transformation Techniques & 20FE04

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

Credits:3

Program/Sem/Sec : I B.Tech/II sem

A.Y.: 2022 - 23

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra. also students introduced to integral transformation which includes Laplace transformation and Z – Transformations.

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

CO1	Investigate the consistency of the system of equations and solve them.
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem.
CO3	Use the concepts of Laplace transforms to various forms of functions.
CO4	Solve Ordinary differential equations by using Laplace Transformations.
CO5	Apply Z- Transformations to solve difference equations.

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

TEXTBOOKS:

T1 Dr. B.S. Grewal, “Higher Engineering Mathematics”, 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, “Higher Engineering Mathematics”, 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, “Advanced Engineering Mathematics”, 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, “Advanced Engineering Mathematics”, 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, “Elementary Differential Equations”, 7th Edition, John Wiley & sons, New Delhi, 2011.

R4 S. S. Sastry, “Introductory Methods of Numerical Analysis” 5th Edition, PHI Learning Private

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Linear System of Equations**

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 the course, Course Outcomes	1	14/03/23		TLM1	
2.	Introduction to UNIT I	1	15/03/23		TLM2	
3.	Echelon form of a matrix	1	16/03/23		TLM1	
4.	Echelon form of a matrix	1	18/03/23		TLM1	
5.	Normal form of a matrix	1	21/03/23		TLM1	
6.	Normal form of a matrix	1	23/03/23		TLM1	
7.	PAQ form	1	25/03/23		TLM1	
8.	Solution of Homogeneous linear system of equations	1	28/03/23		TLM1	
9.	Tutorial 1	1	29/03/23		TLM3	
10.	Solution of Non homogeneous Linear system of equations	1	01/04/23		TLM1	
11.	Solution of Non homogeneous Linear system of equations	1	04/04/23		TLM1	
12.	Solution of Non homogeneous Linear system of equations	1	06/04/23		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	08/04/23		TLM2	
14.	Eigen values of a matrix	1	11/04/23		TLM1	
15.	Eigen values and Eigen vectors of a matrix	1	12/04/23		TLM1	
16.	Eigen values and Eigen vectors of a matrix	1	13/04/23		TLM1	
17.	Properties	1	15/04/23		TLM1	
18.	Properties	1	18/04/23			
19.	Cayley – Hamilton Theorem	1	19/04/23		TLM1	
20.	TUTORIAL 2	1	20/04/23		TLM3	
21.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	25/04/23		TLM1	
22.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	27/04/23		TLM1	

No. of classes required to complete UNIT-II: 10	No. of classes taken:
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UNIT-III: Laplace Transformation

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.	Introduction to Unit-III	1	29/04/23		TLM2		
24.	Standard forms of Laplace Transformations	1	02/05/23		TLM1		
25.	Linear Property, Shifting Theorem	1	03/05/23		TLM1		
26.	Change of scale property, Multiplication by t	1	04/05/23		TLM1		
27.	Multiplication by t	1	06/05/22		TLM1		
28.	Division by t	1	06/05/23		TLM3		
29.	TUTORIAL 3	1	16/05/23		TLM 1		
30.	Transformation derivatives and Integrals	1	17/05/23		TLM1		
31.	Transformation integrals	1	18/05/23		TLM1		
32.	Unit step function and Dirac's delta function	1	20/05/23		TLM1		
No. of classes required to complete UNIT-III: 10				No. of classes taken:			

UNIT-IV: Inverse Laplace Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
33.	Introduction to UNIT IV	1	23/05/23		TLM1		
34.	Linear property	1	24/05/23		TLM1		
35.	Shifting properties	1	25/05/23		TLM1		
36.	Inverse Laplace transformation by using partial fractions	1	27/05/23		TLM1		
37.	Inverse Laplace transformation by using partial fractions	1	30/05/23		TLM1		
38.	Inverse Laplace Transformation by using Convolution theorem	1	31/05/23		TLM1		
39.	Inverse Laplace Transformation by using Convolution theorem	1	01/06/23		TLM3		
40.	TUTORIAL 4	1	03/06/23		TLM1		
41.	Solving of Ordinary differential equation by Laplace transform method	1	06/06/23		TLM1		
42.	Solving of Ordinary differential equation by Laplace transform method	2	07/06/23 08/06/23		TLM3		
No. of classes required to complete UNIT-IV: 11				No. of classes taken:			

UNIT-V: Z- Transformations

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.	Introduction to UNIT V	1	13/06/23		TLM1	

44.	Standard forms of Z-Transformation	1	14/06/23		TLM1
45.	Damping rule	1	15/06/23		TLM1
46.	Shifting Rule	1	17/06/23		TLM1
47.	Initial and final value theorems	1	20/06/23		TLM1
48.	Inverse Z – Transformations	1	21/06/23		TLM1
49.	Inverse Z – Transforms by using partial fractions	1	22/06/23		TLM1
50.	Inverse Z – Transformation by using convolution theorem	1	24/06/23		TLM1
51.	Solving of Difference equations by using Z – Transformations	1	27/06/23		TLM1
52.	Solving of Difference equations by using Z - Transformations	1	01/07/23		TLM1
53.	TUTORIAL 5	1	04/07/23		TLM3
54.	Content beyond the syllabus	1	05/07/23		TLM5
55.	Revision	1	06/07/23		TLM1
No. of classes required to complete UNIT-V:13				No. of classes taken:	

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

PART-C

EVALUATION PROCESS (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	Y.P.C.S. Anil Kumar	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. A. Rami Reddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor	: Dr. Lakshmi V R Babu Syamala	
Course Name & Code	: Engineering Chemistry & 20FE06	
L-T-P Structure	: 3-0-0	Credits: 3
Program/Sem/Sec	: I B.Tech., AIML, II-Sem., (Section-A)	A.Y. : 2022-23

Pre-requisites: Nil

Course Educational Objectives: It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (Cos): After completion of the course, students will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications. (Apply-L3)
CO2	Apply principles of corrosion for design and effective maintenance of various equipments. (Apply-L3)
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine. (Understand-L2)
CO4	Identify the importance of liquid crystals, polymers in advanced technologies. (Understand-L2)
CO5	Apply the principles of analytical techniques in chemical analysis. (Apply-L3)

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	2	-	-	-	-	2
CO2	3	2	2	1	-	2	1	-	-	-	-	2
CO3	3	2	2	1	-	1	1	-	-	-	-	2
CO4	3	2	2	1	-	1	1	-	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	-	2
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

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

BOS APPROVED TEXT BOOKS:

- T1** Shikha Agarwal, "A Text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015
- T2** Jain, Jain, "A textbook of Engineering Chemistry", Dhanpat Rai Publishing Company, Delhi, 16th Edition, 2015.

BOS APPROVED REFERENCE BOOKS:

- R1** Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.
- R2** S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010
- R3 R4** Prasanta Rath, B. Rama Devi, Ch. Venkata Ramana Reddy, Subhendu Chakrot "Engineering Chemistry", Cengage Learning India, 1st Edition, 2019.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: ELECTRO CHEMISTRY & BATTERIES**

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 Engineering Chemistry, Course, COs, Introduction to Unit-I	1	14-03-2023		TLM1	
2.	Applications of Electro chemical Series	1	15-03-2023		TLM1	
3.	Calculation of EMF of Cell		16-03-2023		TLM1	
4.	Calomel Electrode, Nernst equation derivation	1	18-03-2023		TLM1	
5.	Glass Electrode	1	21-03-2023		TLM1	
6.	Applications of Nernst Equation-1	1	23-03-2023		TLM1	
7.	Applications of Nernst Equation-2	1	25-03-2023		TLM1	
8.	Lead-acid Battery	1	28-03-2023		TLM1	
9.	Lithium-ion Battery	1	29-03-2023		TLM1	
10.	H ₂ – O ₂ Fuel cell, Mg-Cu reserve battery	1	01-04-2023		TLM1	
11.	Revision of unit 1, Assignment & Quiz	1	04-04-2023		TLM1	
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

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, Examples, dry corrosion	1	06-04-2023		TLM1	
2.	corrosion by other gases and liquid metal corrosion, Pilling bed worth rule	1	08-04-2023		TLM1	
3.	Conditions for wet corrosion, hydrogen evolution, types of	1	11-04-2023		TLM1	

	wet corrosion				
4.	Mechanism-oxygen absorption,	1	12-04-2023		TLM1
5.	Galvanic Corrosion, passivity and Galvanic series	1	13-04-2023		TLM1
6.	Concentration Cell Corrosion	1	15-04-2023		TLM1
7.	Factors influencing corrosion- Nature of metal	1	18-04-2023		TLM1
8.	Factors influencing corrosion- nature of environment	1	19-04-2023		TLM1
9.	Cathodic Protection	1	20-04-2023		TLM1
10.	Electroplating & metal cladding	1	25-04-2023		TLM1
11.	Revision of unit II	1	26-04-2023		TLM1
12.	Assignment & Quiz	1	27-04-2023		TLM1
No. of classes required to complete UNIT-II: 12				No. of classes taken:	

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials	1	29-04-2023		TLM1	
2.	Gas-Phase synthesis of nanomaterials	1	02-05-2023		TLM1	
3.	Applications of nano materials	1	03-05-2023		TLM1	
4.	Materials in Electronic devices	1	04-05-2023		TLM1	
5.	Contd.. Materials in Electronic devices	1	06-05-2023		TLM1	
6.	Characteristics of Molecular motors and machines	1	16-05-2023		TLM1	
7.	Rotaxanes as artificial molecular machines	1	17-05-2023		TLM1	
8.	Catenanes as artificial molecular machines	1	18-05-2023		TLM1	
9.	Automated light powered molecular motors	1	20-05-2023		TLM1	
10.	Revision of unit III, Assignment & Quiz	1	23-05-2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV : LIQUID CRYSTALS & POLYMERS

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 of liquid crystals	1	24-05-2023		TLM1	
2.	Mechanism of working of liquid crystals & their	1	25-05-2023		TLM2	

	Applications				
3.	Introduction and types of polymerizations	2	27-05-2023 & 30-05-2023		TLM1
4.	Preparation properties and engineering applications of PMMA, Teflon	1	31-05-2023		TLM1
5.	Preparation properties and engineering applications of Polycarbonate, structure of raw, vulcanized rubber	2	01-06-2023 & 03-06-2023		TLM1
6.	Preparation properties and engineering applications of Polyurethane, Buna-S	1	06-06-2023		TLM1
7.	Conducting polymers	1	07-06-2023		TLM1
8.	Bio-degradable polymers	1	08-06-2023		TLM1
9.	Revision of unit IV	1	10-06-2023		TLM1
10.	Assignment & Quiz	1	13-06-2023		
No. of classes required to complete UNIT-IV: 12				No. of classes taken:	

UNIT-V : ANALYTICAL TECHNIQUES

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 Types of analysis	1	14-06-2023		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	2	15-06-2023 & 17-06-2023		TLM1	
3.	Strong acid vs weak base titrations.	1	20-06-2023		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	21-06-2023		TLM1	
5.	Principle of potentiometry Acid-base titration, redox titration .	2	22-06-2023		TLM1	
6.	Colorimetry, Principle determination of iron by thiocyanate as a reagent	1	24-06-2023		TLM1	
7.	Revision of unit V	1	27-06-2023		TLM1	
8.	Assignment & Quiz	1	28-06-2023			
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

CONTENTS BEYOND SYLLABUS

1.	Batteries used in mobile phones of popular companies.	2	01-07-2023 & 04-07-2023		TLM1	
2.	Polymers in industrial	3	05-07-2023		TLM1	

	applications and applications of electroplating with reference to PCBs		& 06-07-2023 & 08-07-2023			
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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 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. L. V. R B. Syamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. NAGARJUNA REDDY

Course Name & Code : DATA STRUCTURES & 20CS03

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

Program/Sem/Sec : B.Tech/CSE(AI&ML)/II

Credits: 3

A.Y.: 2022-23

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.(Understand - L2)
CO2	Apply linear data structures like stack and queue in problem solving.(Apply - L3)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.(Understand - L2)
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(Understand - L2)
CO5	Demonstrate graph traversal techniques and hashing techniques.(Understand - L2)

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

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

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	13-03-2023		TLM1	
2.	Classification of Data Structures	1	14-03-2023		TLM1	
3.	Introduction to Algorithm	1	15-03-2023		TLM1	
4.	Algorithm Analysis	2	16-03-2023 18-03-2023		TLM1	
5.	Asymptotic Notations	2	20-03-2023 21-03-2023		TLM1	
6.	List using Arrays	1	23-03-2023		TLM1	
7.	Single Linked List	3	25-03-2023 27-03-2023 28-03-2023		TLM1	
8.	Double Linked List	2	29-03-2023 01-04-2023		TLM1	
9.	Circular Linked List	2	03-04-2023 04-04-2023		TLM1	
No. of classes required to complete UNIT-I: 15				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	06-04-2023		TLM1	
11.	STACKS USING ARRAYS	1	10-04-2023		TLM1	
12.	STACKS USING LINKED LIST	1	11-04-2023		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	12-04-2023 13-04-2023		TLM1	
14.	POSTFIX EVALUTION	1	15-04-2023		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	17-04-2023		TLM1	
16.	QUEUE	1	18-04-2023		TLM1	
17.	QUEUE USING ARRAY	1	19-04-2023 20-04-2023		TLM1	
18.	QUEUE USING LINKED LIST	1	22-04-2023		TLM1	
19.	CIRCULAR QUEUE	2	24-04-2023 25-04-2023		TLM1	
20.	DEQUE	2	26-04-2023 27-04-2023		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT-III: SORTING TECHNIQUES

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.	Bubble sort	1	01-05-2023		TLM1	
22.	Insertion Sort	1	02-05-2023		TLM1	
23.	Selection Sort	1	03-05-2023		TLM1	
24.	Merge Sort	2	04-05-2023 06-05-2023		TLM1	
25.	Quick Sort	2	15-05-2023 16-05-2023		TLM1	
26.	Heap Sort	2	17-05-2023		TLM1	

			18-05-2023			
27.	Comparison analysis	1	20-05-2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Introduction, Basic Concepts	2	22-05-2023 23-05-2023		TLM1	
29.	Binary Trees	1	24-05-2023		TLM1	
30.	Representation of Binary Trees	1	25-05-2023		TLM1	
31.	Tree Traversals	2	27-05-2023 29-05-2023		TLM1	
32.	Implementation	1	30-05-2023			
33.	Binary Search Trees	2	31-05-2023 01-06-2023		TLM1	
34.	AVL Trees	1	03-06-2023		TLM1	
35.	Operations	2	05-06-2023 06-06-2023		TLM1	
No. of classes required to complete UNIT-IV: 13				No. of classes taken:		

UNIT-V: GRAPHS & HASHING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	GRAPHS, FUNDAMENTALS	2	07-06-2023 08-06-2023		TLM1	
37.	REPRESENTATION OF GRAPHS	1	12-06-2023		TLM1	
38.	BFS	2	13-06-2023 14-06-2023		TLM1	
39.	DFS	2	15-06-2023 17-06-2023		TLM1	
40.	Hashing Introduction	1	19-06-2023		TLM1	
41.	Hash Table, Hash Function	1	20-06-2023		TLM1	
42.	Types of Hash Functions	1	21-06-2023		TLM1	
43.	Separate Chaining	1	22-06-2023		TLM1	
44.	Linear Probing	1	24-06-2023		TLM1	
45.	Quadratic Probing	1	26-06-2023		TLM1	
46.	Double Hashing	1	27-06-2023		TLM1	
47.	Rehashing	1	28-06-2023		TLM1	
No. of classes required to complete UNIT-V: 15				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 project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S.Nagarjuna Reddy	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D.Veeriahaha
Signature				

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, Introduction: History of Python	1	13-03-23		1 & 2	
2.	Usage of Python interpreter, Python shell and Indentation	1	15-03-23		1 & 2	
3.	Python Built-in types, Variables	1	16-03-23		1 & 2	
4.	Assignment & Input-Output Statements	1	17-03-23		1 & 2	
5.	Identifiers, Keywords & Literals	1	18-03-23		1 & 2	
6.	Operators: Arithmetic & Relational Operators	1	20-03-23		1 & 2	
7.	Logical, Assignment & Bit-wise Operators	1	23-03-23		1 & 2	
8.	Python Membership Operators & Python Identity Operators	1	24-03-23		1 & 2	
9.	Control Structures: Conditional Statements-if, if-else	1	25-03-23		1 & 2	
10.	Nested if-else, Jumping Statements: continue, break and pass	1	27-03-23		1 & 2	
11.	Python Loops: while and for loops	1	29-03-23		1 & 2	
12.	Nested loops with examples	1	31-03-23		1 & 2	
13.	Mathematical functions, constants & Random Number functions	1	01-04-23		1 & 2	
14.	Unit-1 Revision/Tutorial	1	03-04-23		1 & 2	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

UNIT-II: Lists, Tuples, Sets & Dictionaries

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.	Lists: Concept, Creating and Accessing Elements	1	06-04-23		1 & 2	
16.	Updating & Deleting Lists	1	10-04-23		1 & 2	
17.	Basic List Operations, Reverse	1	12-04-23		1 & 2	
18.	Indexing, Slicing & Matrices	1	13-04-23		1 & 2	
19.	Built-in List Functions	1	15-04-23		1 & 2	
20.	Tuples: Introduction, Creating & Deleting Tuples	1	17-04-23		1 & 2	
21.	Accessing values in a Tuple, Updating Tuples & Delete Tuple Elements	1	19-04-23		1 & 2	
22.	Basic Tuple Operations, Indexing, Slicing & Matrices	1	20-04-23		1 & 2	
23.	Built-in Tuple Functions	1	21-04-23		1 & 2	
24.	Sets: Concept and Operations	1	24-04-23		1 & 2	
25.	Dictionaries: Introduction, Accessing values in dictionaries	1	26-04-23		1 & 2	
26.	Working with dictionaries, Properties, and functions	1	27-04-23		1 & 2	
27.	Unit-II revision/Tutorial	1	28-04-23		1 & 2	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		

UNIT-III: Functions, Modular Design & Exception Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Functions: Defining a Function, Calling a Function	1	29-04-23		1 & 2	
29.	Types of Functions & Function Arguments	1	01-05-23		1 & 2	
30.	Anonymous functions, Global and Local Variables	1	03-05-23		1 & 2	
31.	Recursion	1	04-05-23		1 & 2	
32.	Modular Design: Creating Modules, Import Statement, from	1	05-05-23		1 & 2	
33.	Date and Time Modules	1	06-05-23		1 & 2	
34.	Exception Handling: Exception, Exception Handling, try clause	1	15-05-23		1 & 2	
35.	Finally, clause and User defined Exceptions	1	17-05-23		1 & 2	
36.	Unit-III Revision/Tutorial	1	18-05-23		1 & 2	
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV: Python Strings, Expression Operations and Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	Python Strings: Concept, Slicing and Escape characters	1	19-05-23		1 & 2	
38.	String special operations and String formatting Operator	2	20-05-23 & 22-05-23		1 & 2	
39.	Tripe Quotes, Raw String and Unicode Strings	2	24-05-23 & 25-05-23		1 & 2	
40.	Built-in String Methods	2	26-05-23 & 27-05-23		1 & 2	
41.	Regular Expression Operations: Using Special Characters and Regular Expression Methods	2	29-05-23 & 31-05-23		1 & 2	
42.	Named Groups in Python Regular Expressions	2	01-06-23 & 02-06-23		1 & 2	
43.	Regular Expression with glob Module	2	03-06-23 & 05-06-23		1 & 2	
44.	Files: Introduction to Files	1	07-06-23		1 & 2	
45.	File operations-Read, Write and Search	1	08-06-23		1 & 2	
46.	Unit-IV revision/Tutorial	1	09-06-23		1 & 2	
No. of classes required to complete UNIT-IV: 16				No. of classes taken:		

UNIT-V: Object Oriented Programming OOP in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Classes	2	12-06-23 & 14-06-23		1 & 2	
48.	Self-Variable	2	15-06-23 & 16-06-23		1 & 2	
49.	Methods	2	17-06-23 & 19-06-23		1 & 2	
50.	Constructor Method	2	21-06-23		1 & 2	

			& 22-06-23		
51.	Inheritance	2	23-06-23 & 24-06-23		1 & 2
52.	Overriding Methods	2	26-06-23 & 28-06-23		1 & 2
53.	Data hiding	2	30-06-23 & 01-07-23		1 & 2
54.	Init-V revision/Tutorial	2	03-07-23 & 05-07-23		1&2
No. of classes required to complete UNIT-V: 16					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 modelling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. S. Govindu	Dr. Y. Vijaya Bhaskar Reddy	Dr. Y. Vijaya Bhaskar Reddy	Dr. D. Veeraiah
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING AI& ML

COURSE HANDOUT

PART-A

Name of Course Instructor	: K.RAVI KIRAN YASASWI	
Course Name & Code	: CONSTITUTION OF INDIA (20MC01)	
L-T-P Structure	: 2-0-0	Credits : 0
Program/Sem/Sec	: B.Tech., CSE AI& ML., II-Sem., A	A.Y: 2022-23

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive, Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

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

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commission and the process and about SC, ST, OBC and women.

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	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

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

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

TEXT BOOKS:

- T1** Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi
- T2** Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

- R1** Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.
- R2** Subash Kashyap, Indian Constitution, National Book Trust.
- R3** J.A. Siwach, Dynamics of Indian Government and Politics.
- R4** D.C. Gupta, Indian Government and Politics.
- R5** H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).
- R6** J.C. Johari, Indian Government and Politics Hans.
- R7** J.Raj, Indian Government and Politics.
- R8** M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.
- R9**Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Dept /Section: CSE AIML A Section

UNIT-I : Introduction to Indian Constitution

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 Co-Po and Syllabus	1	13-03-2023		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	16-03-2023		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	20-03-2023		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	23-03-2023		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	27-04-2023		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	03-04-2023		TLM2	CO1	T1 / T2	
7.	Assignment -I	1	06-04-2023		TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		7			No. of classes taken:			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	10-04-2023		TLM2	CO2	T1 / T2	
9	Federalism Centre State Relationships to the Union, President Role, Power and Position	1	13-04-2023		TLM2	CO2	T1 / T2	
10	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties	1	17-04-2023		TLM2	CO2	T1 / T2	
11	Lok Sabha,Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	20-04-2023		TLM2	CO2	T1 / T2	
12	Assignment II	1	24-04-2023		TLM2	CO2	T1 / T2	
No. of classes required to complete UNIT-II		5			No. of classes taken:			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	State Government and its Administration Governor and Role	1	27-04-2023		TLM2 / TLM4	CO3	T1 / T2	
I MID EXAMINATIONS 08-05-2023 To 13-05-2023								
16	Role of Chief Ministers and Council of Ministers	1	01-05-2023		TLM2 / TLM4	CO3	T1 / T2	
17	State Secretariat Functions	1	04-05-2023		TLM2 / TLM4	CO3	T1 / T2	
18	Organisation ,Structure and Functions of State Governments	1	15-05-2023		TLM2 / TLM4	CO3	T1 / T2	
19	Assignment –III	1	18-05-2023		TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		05			No. of classes taken:			

UNIT-IV: A Local Administration

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
20	A Local Administration	1	22-05-2023		TLM2 / TLM4	CO4	T1 / T2	
21	Role and importance of local administration	1	25-05-2023		TLM2 / TLM4	CO4	T1 / T2	
22	Municipalities –Mayor and Role of Elected Representative	1	29-05-2023		TLM2 / TLM4	CO4	T1 / T2	
23	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles	1	01-06-2023		TLM2 / TLM4	CO4	T1 / T2	
24	Village level-Role of Elected and Appointed officials./Assignment-IV	1	05-06-2023		TLM2/TLM 7	CO4	T1 / T2	
25	Assignment –IV	1	08-06-2023					
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Election Commission

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	Election Commission	1	12-06-2023		TLM2 / TLM4	CO5	T1 / T2	
26	Role of Chief Election Commissioner and Election Commissionerate	1	15-06-2023		TLM2 / TLM4	CO5	T1 / T2	
27	State Election Commission	1	19-06-2023		TLM2 / TLM4	CO5	T1 / T2	
28	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	22-06-2023		TLM2 / TLM4	CO5	T1 / T2	
29	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	26-06-2023		TLM2 / TLM4	CO5	T1 / T2	
30	Assignment -V	1	03-06-2023					
II MID EXAMINATIONS 10-07-2023 To 15-07-2023								
No. of classes required to complete UNIT-V		06			No. of classes taken:			

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Consumer Rights	1	06-07-2023		TLM2/ TLM5		T2/R3	
	Industrial policies							

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
TLM 7	Assignment /Quiz		

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=15
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=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
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=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+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	Programming Paradigms: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	Data Engineering: To inculcate an ability to analyze, design and implement database applications.
PSO 3	Software Engineering: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
K.Ravi Kiran Yasaswi	K.Ravi Kiran Yasaswi	Dr.D.Veeraiah	Dr.D.Veeraiah



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: DR.S. NAGARJUNA REDDY

Course Name & Code : DATA STRUCTURES LAB & 20CS53

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

Credits: 1.5

Program/Sem/Sec : B.Tech/CSE(AIML)/II

A.Y.: 2022-23

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (Apply - L3)

CO2: Implement Various Sorting Techniques. (Apply - L3)

CO3: Implement Non-Linear Data Structure such as Trees & Graphs. (Apply - L3)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

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

PART-B:**COURSE DELIVERY PLAN (LESSON PLAN):**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	List Using Arrays	3	17-03-2023		
2.	Single Linked List	3	24-03-2023		
3.	Double Linked List Circular Linked List	3	31-03-2023		
4.	<i>Stack Using Arrays</i> <i>Stack Using Linked List</i>	3	21-04-2023		
5.	<i>Queue Using Arrays</i> <i>Queue Using Linked List</i>	3	28-04-2023		
6.	Conversions	3	05-05-2023		
7.	Evaluation of Postfix, Balanced Parenthesis	3	19-05-2023		
8.	Circular Queue, Double Ended Queue	3	26-05-2023		
9.	Bubble Sort, Insertion Sort, Selection Sort	3	02-06-2023		
10.	Merge Sort, Quick Sort	3	09-06-2023		
11.	Heap Sort, Binary Tree	3	16-06-2023		
12.	Binary Search Tree Operations	3	23-06-2023		
13.	BFS,DFS	3	30-06-2023		
14.	Internal Exam	3	07-07-2023		

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 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. S.Nagarjuna Reddy	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D. Veeriaha
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. S. Govindu
 Course Name & Code : Python Programming Lab (20CS54)
 L-T-P Structure : 0-0-3 Credits: 1.5
 Program/Sem/Sec : B.Tech., CSM., II-Sem A.Y : 2022-23

PRE-REQUISITE: Basic Knowledge of Programming.

COURSE EDUCATIONAL OBJECTIVES (CEOs): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO 1	Apply building blocks of Python in solving computational problems. (Apply - L3)
CO 2	Implement in-built data structures available in Python to solve computational problems. (Apply - L3)
CO 3	Implement modular programming, string manipulations and Object-oriented programming in python. (Apply - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 – Low			2 – Medium						3 – 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	Python IDE Installation and Basics of Python	6	13-03-23 & 20-03-23		TLM4	
2	Language basics and example problems	6	27-03-23 03-04-23		TLM4	
3	Programs on Lists	6	10-04-23 & 17-04-23		TLM4	
4	Programs on Tuples	3	24-04-23		TLM4	
5	Programs on Sets	3	01-05-23		TLM4	
6	Programs on Dictionaries	3	15-05-23		TLM4	
7	Programs on Functions and Recursion	3	22-05-23		TLM4	
8	Programs on Date and Time Modules, Exception Handling	3	29-05-23		TLM4	
9	Programs on Strings	3	05-06-23		TLM4	
10	Programs on Regular Expressions	3	12-06-23		TLM4	
11	Programs on Object-Oriented Programming	3	19-06-23		TLM4	
12	Programs on Python Libraries – NumPy, Pandas, Matplotlib	3	26-03-23		TLM4	
13	Internal Lab Exam		03-07-23			

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

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. S. Govindu	Dr. Y. Vijaya Bhaskar Reddy	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 FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha
Course Name & Code : Engineering Chemistry Lab & 20FE53
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/II-Sem/AI&ML **A.Y. : 2022-23**

Pre-requisites: Nil

Course Educational Objectives: This course enables the students to analyze water samples and perform different types of volumetric titrations. It provides them with an overview of preparation of polymers and analytical techniques.

Course Outcomes: At the end of the course, the student shall be able to

CO1: Assess alkalinity of water based on the procedure given. (L2)

CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (L2)

CO3: Acquire practical knowledge related to preparation of polymers. (L2)

CO4: Exhibit skills in performing experiments based on theoretical fundamentals. (L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

REFERENCE: BOS Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Engineering Chemistry lab	3	14-03-2023		TLM1	CO4	
2.	Introduction to volumetric analysis.	3	21-03-2023		TLM1	CO4	
3.	Determination of pH of the given sample solution/soil using pH meter.	3	28-03-2023		TLM4	CO3,CO4	
4.	Determination of amount of Na ₂ CO ₃ using standard HCl solution.	3	04-04-2023		TLM4	CO2,CO4	
5.	Determination of alkalinity of water sample.	3	11-04-2023		TLM4	CO3,CO4	
6.	Determination of Mg ⁺² using standard EDTA solution.	3	18-04-2023		TLM4	CO2,CO4	
7.	Estimation of Mohr's salt using potassium permanganate.	3	25-04-2023		TLM4	CO2,CO4	
8.	Estimation of Mohr's salt using potassium dichromate.	3	02-05-2023		TLM4	CO2,CO4	
9.	Preparation of Bakelite	3	16-05-2023		TLM4	CO1,CO4	
10.	Preparation of nylon fibres.	3	23-05-2023		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	30-05-2023		TLM4	CO2,CO4	
12.	Estimation of amount of HCl conductometrically using NH ₄ OH solution	3	06-06-2023		TLM4	CO2,CO4	
13.	Revision	3	13-06-2023 & 20-06-2023		TLM4	CO2,CO4	
14.	Lab Internal Exam(Batch-I)	3	27-06-2023		TLM4	CO2,CO4	
15.	Lab Internal Exam(Batch-II)	3	04-07-2023		TLM4	CO2,CO4	
Total							

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		15 Marks

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: O.VENKATA SIVA	
Course Name & Code	: SHELL SCRIPTING LAB & 20CS55	
L-T-P Structure	: 0-0-2	Credits : 1
Program/Sem/Sec	: B.Tech., CSM., II-Sem., Section-A	A.Y : 2022-23
PRE-REQUISITES	: Nil	

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

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

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

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

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

REFERENCE BOOKS:

- R1** Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656
- R2** UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. Gilberg Publisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256
- R3** Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

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	HOD Sign
1.	Module – I: Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	15-03-2023		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	22-03-2023		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	29-03-2023		
4.	Module–II: Introduction to Shell- Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments, Basic Operators	2	05-04-2023		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	12-04-2023		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	19-04-2023		
7.	Module – III: Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	26-04-2023		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	03-05-2023		

9.	Commands related to inode, I/O redirection and piping, process control commands, mails.	2	17-05-2023		
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	24-05-2023 31-05-2023 07-06-2023		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	14-06-2023 21-06-2023		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	28-06-2023		
13.	Lab Internal Exam	2	05-07-2023		

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PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. O.Venkatasiva	Dr. S.Jayaprada	Dr. D.V.Subbaiah	Dr. D. Veeraiah
Signature				