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

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 Comp 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	

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

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

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

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: Dr. S. NAGARJUNA REDDY
Course Name & Code : DATA STRUCTURES & 20CS03
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE(AI&ML)/II **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 TECHNQIUES

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.Veeriaha
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: S. GOVINDU
Course Name & Code   : PYTHON PROGRAMMING & 20CS05
L-T-P Structure   : 3-0-0   **Credits:** 3
Program/Sem/Sec   : B.Tech II Sem CSM   **A.Y.:** 2022-23

PREREQUISITE:

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

CO1	Identify basic building blocks of python to solve mathematical problems. (Understand- L2)
CO2	Apply the in-built data structures like list, tuple, set and dictionary for solving problems. (Apply - L3)
CO3	Use exception-handling mechanism to catch run-time errors (Apply - L3)
CO4	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling. (Understand - L2)
CO5	Demonstrate object-oriented programming principles of python. (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	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:
1. Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford Publications
2. Python for Everybody: Exploring Data In Python 3by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:
1. Gowrishankar S and Veena A, "Introduction to Python Programming", CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK.
2. R. Nageswara Rao, "Core python programming", Dreamtech, 2017.
3. 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.	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):

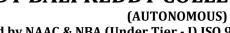|	
PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching 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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http://cse.lbrce.ac.in, cselbreddy@gmail.com, Phone: 08659-222933, Fax: 08659-222931

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 Commision 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 Commision 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.

R9Noorani, 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 Commisionerate	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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hodcse@lbrce.ac.in, cseoffice@lbrce.a.cin, Phone: 08659-222933, Fax: 08659-222931
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.	*Stack Using Arrays Stack Using Linked List*	3	21-04-2023		
5.	*Queue Using Arrays Queue Using Linked List*	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				

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor   : 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
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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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_2CO_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_4OH 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. GilbergPublisher: 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		

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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PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
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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				