



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

Accredited by NAAC&NBA(Under Tier-I), ISO9001:2015 Certified Institution  
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada  
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.  
http://lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931

**FRESHMAN ENGINEERING DEPARTMENT**

**COURSE HANDOUT**

**PART-A**

<b>PROGRAM</b>	: II B. Tech., III-Sem., AI&DS (B)
<b>ACADEMIC YEAR</b>	: 2022-23
<b>COURSE NAME &amp; CODE</b>	: PROBABILITY AND STATISTICS
<b>L-T-P STRUCTURE</b>	: 3-0-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: M. Rami Reddy
<b>COURSE COORDINATOR</b>	: M. Rami Reddy
<b>PRE-REQUISITES</b>	: None

**COURSE EDUCATIONAL OBJECTIVES (CEO):** The objective of this course is to provide students with the foundations and applications of probabilistic and statistical methods mainly used in varied applications in engineering and science.

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

<b>CO1</b>	Understand various probabilistic situations using the laws of probability and Random variables.	<b>Understand - L2</b>
<b>CO2</b>	Apply probability distributions like Binomial, Poisson, Normal and Exponential distributions in solving engineering problems.	<b>Apply - L3</b>
<b>CO3</b>	Calculate the standard error of sampling distribution and confidence intervals for parameters like mean and proportion based on sample data.	<b>Apply - L3</b>
<b>CO4</b>	Analyze the data scientifically with the appropriate statistical methodologies to apply the suitable test of hypothesis.	<b>Analyze - L4</b>
<b>CO5</b>	Construct the regression lines to predict the dependent variables and calculate the Correlation Coefficient for a bivariate statistical data.	<b>Apply - L3</b>

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

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

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

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

**BOS APPROVED TEXT BOOKS:**

- T1 Jay L.Devore “Probability and Statistics for engineering and the sciences.” , 8th edition, Cengage Learning india, 2012
- T2 S.C.Gupta, V.K.Kapoor, “Fundamentals of Mathematical Statistics”, 11thEdition, Sultan Chand and sons, New Delhi,2014.

**BOS APPROVED REFERENCE BOOKS:**

- R1 Miller & Freund’s “Probability and Statistics for Engineers”,8th edition. PHI, New Delhi,2011.
- R2 B.V. Ramana, “Higher Engineering Mathematics”, 1st Edition, TMH, New Delhi, 2010.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Probability and Random Variables

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 class, course outcomes	1	12-09-22		TLM1	
2.	Basic concepts of probability	1	13-09-22		TLM1	
3.	problems on basic probability	1	14-09-22		TLM1	
4.	Addition theorem, problems	1	17-09-22		TLM1	
5.	Problems on Addition theorem	1	19-09-22		TLM1	
6.	Multiplication theorem, examples	1	20-09-22		TLM1&2	
7.	Independent events, theorems	1	21-09-22		TLM1	
8.	Baye's theorem, Examples	1	24-09-22		TLM1	
9.	Problems on Baye's theorem	1	26-09-22		TLM1&2	
10.	Random variables, Expectations	1	27-09-22		TLM1	
11.	Problems on PMF	1	28-09-22		TLM1	
12.	Problems on PDF	1	01-10-22		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

#### UNIT-II: Probability Distributions

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.	Binomial Distribution- mean & variance	1	10-10-22		TLM1&2	
2.	Problems on Binomial distribution	1	11-10-22		TLM1	
3.	Fitting of binomial distribution	1	12-10-22		TLM1	
4.	Poisson distribution, mean and variance	1	15-10-22		TLM1&2	
5.	Problems on Poisson distribution	1	17-10-22		TLM1	
6.	Fitting of Poisson distribution	1	18-10-22		TLM1	
7.	Normal distribution: mean & variance	1	19-10-22		TLM1&2	
8.	Problems on Normal Distribution	1	22-10-22		TLM1	
9.	Problems on Normal Distribution	1	25-10-22		TLM1	
10.	Exponential distribution	1	26-10-22		TLM1	
11.	Problems on Exponential distribution	1	29-10-22		TLM1	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

#### UNIT-III: Sampling distribution and Estimation

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.	Sampling distribution ,definitions	1	31-10-22		TLM1&2	
2.	Sampling distribution of mean, variance	1	01-11-22		TLM1	
3.	Sampling distribution -problems	1	02-11-22		TLM1&2	
4.	Central limit theorem, Examples	1	05-11-22		TLM1&2	
5.	<b>Mid-I examinations</b>		07-11-22 to 12-11-22			
6.	Problems on central limit theorem	1	14-11-22		TLM1	
7.	Point and interval estimation	1	15-11-22		TLM1&2	
8.	Confidence Interval of mean	1	17-11-22		TLM1	
9.	Problems	1	16-11-22		TLM1	
10.	Confidence Interval of proportion	1	19-11-22		TLM1	
11.	Confidence Interval of mean (n<30)	1	21-11-22		TLM1	
12.	problems	1	22-11-22		TLM1&2	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

#### UNIT-IV: Tests of Hypothesis

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.	Testing of Hypothesis , definitions	1	23-11-22		TLM1&2	

2.	Z-test for single mean	1	26-11-22		TLM 1
3.	Z-test for difference of means	1	28-11-22		TLM 1
4.	Z-test for single Proportion	1	29-11-22		TLM 1
5.	Z-test for difference of Proportions	1	30-11-22		TLM 1
6.	t-test for single mean	1	03-12-22		TLM 1
7.	t-test for difference of means	1	05-12-22		TLM 1
8.	Paired t-test	1	06-12-22		TLM 1
9.	problems on means	1	07-12-22		TLM 1
10.	F-test for variances	1	12-12-22		TLM 1
11.	$\chi^2$ -test for goodness of fit	1	13-12-22		TLM 1
12.	$\chi^2$ -test for independence of attributes	1	14-12-22		TLM 1
No. of classes required to complete UNIT-IV: 12				No. of classes taken:	

### UNIT-V :Correlation and Regression

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.	Simple Bi-variate Correlation	1	17-12-22		TLM 1&2	
2.	Problems on Pearson's Correlation	1	19-12-22		TLM 1	
3.	Regression lines	1	20-12-22		TLM 1	
4.	Problems on Regression lines	1	21-12-22		TLM 1	
5.	Properties of Regression coefficients	1	24-12-22		TLM 1&2	
6.	Problems on Regression coefficients	1	26-12-22		TLM 1	
7.	Problems on rank Correlation	1	27-12-22		TLM 1	
8.	Problems on repeated ranks	1	28-12-22		TLM 1	
9.	Practice problems	1	31-12-22		TLM 1	
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/SwayamPrabha/MOOCs)
TLM3	Tutorial	TLM6	Group Discussion/Project

## PART-C

### EVALUATION PROCESS (R20 Regulations):

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

## PART-D

### Program Educational Objectives (PEOs):

<b>PEO1</b>	To develop intelligent systems with a cutting-edge combination of machine learning, analytics, and visualization technologies.
<b>PEO2</b>	To adapt the new technologies and develop the solutions to real world problems with ethical practices thereby contributing to the society.
<b>PEO3</b>	To continue education for fulfilling their long-term goals and achieve satisfaction as successful professionals in industry, academia and research.

## Program Outcomes (POs):

<b>PO1 - Engineering Knowledge</b>	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO2 - Problem Analysis</b>	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO3 - Design / Development of Solutions</b>	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.
<b>PO4 - Conduct Investigations of Complex Problems</b>	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.
<b>PO5 - Modern Tool Usage</b>	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.
<b>PO6 - The Engineer and Society</b>	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.
<b>PO7 - Environment and Sustainability</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO8 - Ethics</b>	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9 - Individual and Team Work</b>	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO10 - Communication</b>	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.
<b>PO11 - Project Management and Finance</b>	Demonstrate knowledge and understanding of the ring 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.
<b>PO12 - Life-long Learning</b>	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## Program Specific Outcomes (PSOs):

<b>PSO1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.

Course Instructor  
(M.Rami Reddy)

Course Coordinator  
(M.Rami Reddy)

Module Coordinator  
(Dr.A.Rami Reddy)

HOD  
(Dr.A.Rami Reddy)



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[hodads@lbrce.ac.in](mailto:hodads@lbrce.ac.in) , [ads@lbrce.ac.in](mailto:ads@lbrce.ac.in), Phone: 08659-222933, Fax: 08659-222931

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

## COURSE HANDOUT

### PART-A

**Name of Course Instructor :** Mr. S. Siva Ramakrishna

**Course Name & Code :** Web Application Development using Full Stack - Module-I  
(Frontend Development) & 20CSS1

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

**Credits: 2**

**Program/Sem/Sec :** B.Tech. – AI&DS/III/B

**A.Y.: 2022-23**

**PREREQUISITE: Knowledge of basic Computer hardware & software.**

#### **COURSE EDUCATIONAL OBJECTIVES (CEOs):**

The objective of the course is to understand the design of HTML web pages, Styling of HTML pages using CSS, web forms validation using JavaScript and developing responsive web page using JQuery.

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

<b>CO1</b>	Understand the basic UI/UX design and styling of web pages ( <b>Understand- L2</b> )
<b>CO2</b>	Understand the DOM of web design, markup language and client-side scripting. ( <b>Understand- L2</b> )
<b>CO3</b>	Understand the responsive web design using DHTML. ( <b>Understand- L2</b> )
<b>CO4</b>	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
<b>CO1</b>	-	-	2	-	2	-	-	-	-	-	-	-	3	2	-
<b>CO2</b>	-	-	2	-	2	-	-	-	-	-	-	-	3	2	-
<b>CO3</b>	-	-	2	-	2	-	-	-	-	-	-	-	3	2	-
<b>CO4</b>	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

#### **REFERENCE BOOKS:**

<b>R1</b>	HTML & CSS: The Complete Reference, 5th Edition by Thomas Powell, McGrawHill, 2017.
<b>R2</b>	Beginning HTML, XHTML, CSS, and JavaScript by Jon Duckett, Wiley India, 2010.
<b>R3</b>	jQuery Cookbook by Cody Lindley, O'Reilly Media, 2009
<b>R4</b>	HTML, XHTML, and CSS Bible, 5th Edition by Steven M. Schafer, Wiley India, 2011.
<b>R5</b>	Web Development with jQuery by Richard York, Wiley India, 2015
<b>R6</b>	Head first HTML & CSS 2nd Edition by Elisabeth Robson, Eric Freeman, O'Reilly

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Lab Cycle-1	4	15-09-2022		DM5	
2.	Lab Cycle-1	4	22-09-2022		DM5	
3.	Lab Cycle-2	4	29-09-2022		DM5	
4.	Lab Cycle-2	4	13-10-2022		DM5	
5.	Lab Cycle-3	4	20-10-2022		DM5	
6.	Lab Cycle-3	4	27-10-2022		DM5	
7.	Lab Cycle-4	4	03-11-2022		DM5	
8.	Lab Cycle-4	4	17-11-2022		DM5	
9.	Lab Cycle-5	4	24-11-2022		DM5	
10.	Lab Cycle-5	4	01-12-2022		DM5	
11.	Lab Cycle-6	4	08-12-2022		DM5	
12.	Lab Cycle-6	4	15-12-2022		DM5	
13.	Lab Cycle-6	4	22-12-2022		DM5	
14.	Revision	4	29-12-2022		DM5	

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

## PART-C

### EVALUATION PROCESS (R20 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	Mr. S. Siva Ramakrishna	Mr. A. Raja Gopal	Dr. K. Naga Prasanthi	Dr. O. Rama Devi
<b>Signature</b>				





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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

### COURSE HANDOUT

**PROGRAM** : B.Tech., III-SEM (SEC-B)

**ACADEMIC YEAR** : 2022-23

**COURSE NAME & CODE** : COMPUTER ARCHITECTURE– 20AD02

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

**COURSE CREDITS** : 3

**COURSE INSTRUCTOR** : Dr.O.Rama Devi

**COURSE COORDINATOR** : Dr.O.Rama Devi

**PRE-REQUISITE:** Fundamentals of computer hardware

**COURSE OBJECTIVE:.** The objective of the course is to learn about the functional blocks and data representation of computer system and understands the design principles of processor and organization and management of memory and peripheral devices.

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

**CO1:** Identify the functional blocks of a computer and Instruction set architecture of CPU. (Understand-L2)

**CO2:** Understand Data representation and perform computer arithmetic operations. (Apply-L3)

**CO3:** Illustrate the design principles of control unit and pipelining. (Understand-L2)

**CO4:** Analyze the memory hierarchy in a computer system. (Analyze-L4)

**CO5:** Discuss the working principles of peripheral devices, their interfaces, and characteristics. (Understand-L2)

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	2		2										1		
CO2			3										2		
CO3	2		2										2		
CO4			2										2		
CO5			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).



**TEXT BOOKS:**

- T1** M. Morris Mano, “Computer Systems Architecture”, Pearson Education publishers. [units-1,2]
- T2** Carl Hamacher, Zvonks Vranesic, SafeaZaky, “Computer rganization”, TMHpublications. [units-3,4,5]

**REFERENCE BOOKS:**

- R1** William Stallings, “Computer Organization and Architecture”, Pearson/PHI publishers, 6<sup>th</sup> edition, 2004.
- R2** Andrew S. Tanenbaum, “Structured Computer Organization”, Pearson/PHI publishers, 4<sup>th</sup> edition, 2005.
- R3** Sivarama P. Dandamudi, “Fundamentals or Computer Organization and Design”, Springer publishers, 1<sup>st</sup> edition, 2003.

**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I : Functional blocks of a computer**

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.	Block Diagram of a Computer, Basic Functional Units of a Computer	1	12.09.2022		TLM2	
2.	CPU, memory, input-output subsystems, control unit.	1	13.09.2022		TLM2	
3.	Instruction set architecture of a CPU–registers	2	14.09.2022/ 16.09.2022		TLM2	
4.	Instruction execution cycle	2	19.09.2022/ 20.09.2022		TLM2	
5.	RTL interpretation of instructions	2	21.09.2022/ 23.09.2022		TLM2	
6.	Addressing modes	1	26.09.2022		TLM2	
7.	Instruction set	1	27.09.2022		TLM2	
8.	Case study – instruction sets of some common CPUs.	1	28.09.2022		TLM2	
9.	Tutorial	1	30.09.2022		TLM3	
<b>No. of Classes Required to complete UNIT I: 12</b>				<b>No. of classes taken:</b>		

**UNIT-II: Data representation**

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.	Signed number representation	1	10.10.2022		TLM2	
11.	Computer arithmetic – integer addition	2	11.10.2022/ 12.10.2022		TLM2	
12.	Subtraction	2	14.10.2022/ 17.10.2022		TLM2	
13.	Carry look- a head adder	1	18.10.2022		TLM2	
14.	Multiplication – shift-and add	1	19.10.2022		TLM2	
15.	Booth multiplier	1	21.10.2022/		TLM2	
16.	Division restoring and non-restoring techniques	1	25.10.2022		TLM2	
17.	Floating point arithmetic	1	26.10.2022		TLM2	
<b>No. of Classes Required to complete UNIT II :12</b>				<b>No. of classes taken:</b>		

**UNIT-III: CPU control unit design**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Hardwired and micro-programmed design approaches.	1	28.10.2022		TLM2	
19.	Pipelining:Basic concepts of pipelining.	2	31.10.2022/ 1.11.2022		TLM2	
20.	Throughput and speedup	1	2.11.2022		TLM2	
21.	pipeline hazards	1	4.11.2022		TLM2	
22.	<b>Parallel Processors:</b> Introduction to parallel processors	2	14.11.2022/ 15.11.2022		TLM2	

23.	Concurrent access to memory	2	16.11.2022/ 18.11.2022		TLM2	
24.	Cache coherency	2	21.11.2022/ 22.11.2022		TLM2	
<b>No. of Classes Required to complete UNIT III: 11</b>				<b>No. of classes taken:</b>		

#### UNIT-IV: Memory system design

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Semiconductor memory technologies	2	23.11.2022/ 25.11.2022		TLM2	
26.	Memory organization	2	28.11.2022/ 29.11.2022		TLM2	
27.	Memory interleaving	2	30.11.2022/ 02.12.2022		TLM2	
28.	Concept of hierarchical memory organization	2	05.12.2022/ 06.12.2022		TLM2	
29.	Cache memory, cache size vs. block size	2	07.12.2022/ 09.12.2022		TLM2	
30.	Mapping functions, replacement algorithms, write policies	1	12.12.2022		TLM2	
<b>No. of Classes Required to complete UNIT IV : 11</b>				<b>No. of classes taken:</b>		

#### UNIT-V: Peripheral devices and their characteristics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	Input-output subsystems	2	13.12.2022/ 14.12.2022		TLM2	
32.	I/O device interface	2	16.12.2022/ 19.12.2022		TLM2	

33.	I/O transfers– program controlled	2	20.12.2022/ 21.12.2022		TLM2
34.	Interrupt driven and DMA	1	23.12.2022/ 		TLM2
35.	Privileged and non- privileged instructions	2	26.12.2022/ 27.12.2022		TLM2
36.	Software interrupts and exceptions	2	28.12.2022/ 30.12.2022/		TLM2
<b>No. of Classes Required to complete UNIT V: 11</b>				<b>No. of classes taken:</b>	

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

### EVALUATION PROCESS:

Evaluation Task	Marks
Assignment –1	A1=5
Assignment –2	A2=5
Quiz-1	B1=10
I-Mid Examination	C1=20
Assignment –3	A3=5
Assignment –4	A4=5
Assignment --5	A5=5
Quiz-2	B2=10
II-Mid Examination	C2=20
Evaluation of Assignment Marks: $A=(A1+A2+A3+A4+A5)/5$	A=5
Evaluation of Quiz Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	B=10
Evaluation of Mid Marks: $C=75\%$ of Max(C1,C2)+25% of Min(C1,C2)	C=20
Attendance	D=5
<b>Cumulative Internal Examination : A+B+C+D</b>	<b>A+B+C+D=40</b>
<b>Semester End Examinations</b>	<b>E=60</b>
<b>Total Marks: A+B+C+D+E</b>	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

<b>PSO1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO3</b>	To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

Course Instructor  
(Dr. O Rama Devi)

Course Coordinator  
(Dr. O Rama Devi)

Module Coordinator  
(Dr. O Rama Devi)

HOD  
(Dr. O Rama Devi)



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**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**PYTHON**

**PROGRAMMING COURSE HANDOUT**

**COURSE HANDOUT**

**PART-A**

**Name of Course Instructor :** K.Sudhakar

**Course Name & Code :** Python Programming (20CS05)

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

**Program/Sem/Sec :** B.Tech / III /SEC-A

**Credits:** 3

**A.Y.:** 2022-23

**PREREQUISITE:** Problem Solving Skills

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**

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

<b>CO1</b>	Identify basic building blocks of python to solve mathematical problems. (Understand- L2)
<b>CO2</b>	Apply the in-built data structures like list, tuple, set and dictionary for solving problems. (Apply - L3)
<b>CO3</b>	Use exception-handling mechanism to catch run-time errors (Apply - L3)
<b>CO4</b>	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling. (Understand - L2)
<b>CO5</b>	Demonstrate object-oriented programming principles of python. (Understand - L2)

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	-	3	-	-	-	-	1		2	3	-	
CO2	3	2	1	-	3	-	-	-	-	1		2	3	-	
CO3	3	2	1	-	3	-	-	-	-	1		2	3	-	
CO4	3	2	1	-	3	-	-	-	-	1		2	3	-	
CO5	3	1	2	-	3	-	-	-	-	1		1	3	2	3



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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 & HALL BOOK.

**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):** Python Programming (20CS05)

**UNIT-I:** Introduction to Python, Operators, and 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.	Course introduction	1	13.09.2022	13.09.2022	TLM1	
2.	History of Python, Usage of Python interpreter	1	15.09.2022	15.09.2022	TLM1	
3.	Python Shell, Indentation	1	16.09.2022	16.09.2022	TLM1,4	
4.	Python Built-in types	1	20.09.2022	20.09.2022	TLM1	
5.	Variables, Assignment, Identifiers and keywords , Input- Output Statements, Literals	1	21.09.2022	21.09.2022	TLM1,4	





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6.	Arithmetic operators, Relational operators, Logical operators,	1	22.09.2022	22.09.2022	TLM1,4
7.	Assignment operators, Bitwise operators, Python Membership Operator s (in & not in), Simple Programs.	1	23.09.2022	23.09.2022	TLM1,4
8.	Python Identity Operators (is & is not), Operator precedence.	1	27.09.2022	27.09.2022	TLM1,4
9.	Conditional Statements - if, if-else, Nested if- else.	1	28.09.2022	28.09.2022	TLM1,4
10.	Python Loops – while, for	1	29.09.2022	29.09.2022	TLM1,4
11.	Nested loops with Programming Exampl es,	1			TLM1,4
12.	Mathematical Functions and Constants (import math), Random Number Functions	1	30.09.2022	30.09.2022	TLM1,4
<b>No. of classes required to complete UNIT-I: 13</b>				<b>No. of classes taken:</b>	



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**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
13.	<b>Lists:</b> Concept, Creating and Accessing Elements, Updating & Deleting Lists.	1	11.10.2022	11.10.2022	TLM1,4	
14.	Basic List Operations, Reverse, Indexing, Slicing and Matrices, Built-in List Functions	2	12.10.2022	12.10.2022	TLM1,4	
15.	Sample Programs on Lists	1	13.10.2022	13.10.2022	TLM1,4	
16.	<b>Tuples:</b> Introduction, Creating & Deleting Tuples, Accessing values in a Tuple, Updating tuples, Delete Tuple Elements.	1	14.10.2022	14.10.2022	TLM1,4	
17.	Basic Tuple Operations, Indexing, Slicing and Matrices, built-in tuple Functions.	2	18.10.2022	18.10.2022	TLM1,4	
18.	Sample Programs on Tuples	1	19.10.2022	19.10.2022	TLM1,4	
19.	<b>Sets:</b> Concept, Operations	1	20.10.2022	20.10.2022	TLM1,4	
20.	<b>Dictionaries:</b> Introduction, Accessing values in dictionaries.	2	21.10.2022	21.10.2022	TLM1,4	



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21.	Working with dictionaries, Properties, Functions.	2	25.10.2022	25.10.2022	TLM1,4	
<b>No. of classes required to complete UNIT-I: 13</b>					<b>No. of classes taken:</b>	

**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
22.	<b>Functions:</b> Defining a Function, Calling a Function	1	26.10.2022	26.10.2022	TLM1,4	
23.	Types of Functions, Function Arguments	2	27.10.2022	27.10.2022	TLM1,4	
24.	Anonymous functions, Global and Local Variables	1	28.10.2022	28.10.2022	TLM1,4	
25.	Recursion	1	1.11.2022	1.11.2022	TLM1,4	
26.	<b>Modular Design:</b> Creating modules	1	2.11.2022	2.11.2022	TLM1,4	
27.	import statement, from	1	04.11.2022	04.11.2022	TLM1,4	
28.	Date and Time Module	1	15.11.2022	15.11.2022	TLM1,4	
29.	<b>Exception Handling:</b> Exception, Exception Handling.	2	16.11.2022	16.11.2022	TLM1,4	
30.	except clause, Try, finally clause	2	17.11.2022	17.11.2022	TLM1,4	
31.	User Defined Exceptions.	1	18.11.2022	18.11.2022	TLM1,4	



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No. of classes required to complete UNIT-III : 13

No. of classes taken:



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**PROGRAMMING COURSE HANDOUT**

**UNIT-IV: Python 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
32.	<b>Python strings:</b> Concept, Slicing, Escape characters	1	22.11.2022	22.11.2022	TLM1,4	
33.	String Special Operations, String formatting Operator	2	23.11.2022	23.11.2022	TLM1,4	
34.	Triple Quotes, Raw String, Unicode Strings.	1	24.11.2022	24.11.2022	TLM1,4	
35.	Built-in String methods	1	25.11.2022	25.11.2022	TLM1,4	
36.	<b>Regular Expression Operations:</b> Using Special Characters.	1	29.11.2022	29.11.2022	TLM1,4	
37.	Regular Expression Methods	1	30.11.2022	30.11.2022	TLM1,4	
38.	Named Groups in Python Regular Expressions, Regular Expression with glob Module.	2	01.12.2022	01.12.2022	TLM1,4	
39.	Files: Introduction to files	1	02.12.2022	02.12.2022	TLM1,4	
40.	file operations- Read, write, search	2	06.12.2022	06.12.2022	TLM1,4	
<b>No. of classes required to complete UNIT-IV : 12</b>				<b>No. of classes taken:</b>		



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**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
41.	Object Oriented Programming OOP in Python introduction	1	07.12.2022	07.12.2022	TLM1,4	
42.	Classes	1	08.12.2022	08.12.2022	TLM1,4	
43.	'self-variable', Methods	1	15.12.2022	15.12.2022	TLM1,4	
44.	Sample Programs	1	16.12.2022	16.12.2022	TLM1,4	
45.	Constructor Method	1	20.12.2022	20.12.2022	TLM1,4	
46.	Inheritance	1	22.12.2022	22.12.2022	TLM1,4	
47.	Sample Programs	1	23.12.2022	23.12.2022	TLM1,4	
48.	Overriding Methods	1	27.12.2022	27.12.2022	TLM1,4	
49.	Data hiding	1	28.12.2022	28.12.2022	TLM1,4	
<b>No. of classes required to complete UNIT-V : 09</b>				<b>No. of classes taken:</b>		

**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
50	Advanced Topics (Working with Numpy)	1			TLM5	
51	Advanced Topics (Working with Pandas)	1			TLM5	



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**PROGRAMMING COURSE HANDOUT**

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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))	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
Total Marks = CIE + SEE	<b>100</b>





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**PART-D**

**PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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<b>PO 5</b>	<b>Modern tool usage:</b> 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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**PYTHON**

**PROGRAMMING COURSE HANDOUT**

<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
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**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HoD</b>
<b>K Sudhakar</b>	<b>Mr S. Siva Rama Krishna</b>	<b>Dr O. Rama Devi</b>	<b>Dr O. Rama Devi</b>



# 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 ARTIFICIAL INTELLIGENCE & DATA SCIENCE

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** V.Sowjanya

**Course Name & Code** : DATABASE MANAGEMENT SYSTEMS & 20CS07

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

**Credits:** 3

**Program/Sem/Sec** : B.Tech III Sem AI & DS-A

**A.Y.:** 2022-23

#### **PREREQUISITE:**

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The Objective of this course is to know about basic concepts of DBMS, Database Languages, Database Design, Normalization Process, Transaction Processing, Indexing, and Interfacing with NOSQL using MongoDB.

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

<b>CO1</b>	State the Basic Components of Database Management System and data modelling using Entity-Relationship Diagrams. <b>(Understand- L2)</b>
<b>CO2</b>	Examine the relational model using Structured Query Language (SQL). <b>(Apply - L3)</b>
<b>CO3</b>	Employ principles of normalization for effective database design. <b>(Apply - L3)</b>
<b>CO4</b>	Demonstrate the necessity of transaction processing, Concurrency control mechanisms and recovery strategies in DBMS. <b>(Understand- L2)</b>
<b>CO5</b>	Describe file organization, indexing techniques and the competency in selecting NoSQL Database. <b>(Understand- L2)</b>

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

#### **TEXTBOOKS:**

**T1** Henry F. Korth, Abraham Silberschatz, S.Sudarshan, "Database System Concepts", McGrawHill, 6th edition, 2009.

**T2** Shashank Tiwari, "ProfessionalNoSql", John Wiley& Sons, 2011.

#### **REFERENCE BOOKS:**

**R1** Raghu Ramakrishnan, JohannesGehrke, –Database Management System||, McGrawHill, 3rd edition, 2000.

**R2** Date C J, –An Introduction to Database System, Pearson Education, 8th edition, 2003.

**R3** RamezElmasri, ShamkanthB.Navathe, "Fundamentals of Database Systems", Addison Wesley, 6th edition, 2010.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: DBMS Introduction & Data Modelling using the Entity Relationship Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, <b>Introduction:</b> An overview of Database Management System	1	13/9/22		1 & 2	
2.	Database System Vs File System,	1	15/9/22		1 & 2	
3.	Database System Concepts	1	16/9/22		1 & 2	
4.	Three Schema Architecture,	1	17/9/22		1 & 2	
5.	DataModels	1	20/9/22		1 & 2	
6.	Database Schema and Instances, DataIndependence	1	22/9/22		1 & 2	
7.	Database Languages, Database Structure	1	23/9/22		1 & 2	
9.	<b>Data Modelling using the Entity Relationship Model:</b> ER model concepts, Notation for ER Diagram	1	24/9/22		1 & 2	
10.	Mapping Constraints, Keys	1	27/9/22		1 & 2	
11	Concepts of Super Key, Candidate Key, Primary Key	2	30/9/22		1 & 2	
12	Generalization, Aggregation	1	1/10/22		1 & 2	
13	Reduction of an ER Diagrams to Tables, Relationships of Higher Degree.	1	11/10/22		1 & 2	
<b>No. of classes required to complete UNIT-I: 14</b>				<b>No. of classes taken:</b>		

#### UNIT-II: Relational Data Model and Language & Introduction to SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14	<b>Relational Data Model and Language:</b> Relational Data Model Concepts, Integrity Constraints	1	13/10/22		1 & 2	
15	Entity Integrity, Referential Integrity	1	14/10/22		1 & 2	
16	Key Constraints, Domain Constraints	1	15/10/22			
17	Relational Algebra	1	18/10/22			
18	<b>Introduction to SQL:</b> Characteristics of SQL, Advantage of SQL	1	20/10/22		1 & 2	
19	SQL Data types and Literals, Insert, Update and Delete Operations	1	21/10/22		1 & 2	
20	Tables, Views, and Indexes	1	22/10/22		1 & 2	
21	Nested Queries, Aggregate Functions	1	27/10/22		1 & 2	
22	Joins, Unions, Intersection, Minus	1	28/10/22		1 & 2	
23	Cursors in SQL, Triggers in SQL	1	29/10/22		1 & 2	
<b>No. of classes required to complete UNIT-II: 10</b>				<b>No. of classes taken:</b>		

#### UNIT-III: Normalization

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
24	<b>Normalization:</b> Functional Dependencies	1	1/11/22		1 & 2		
25	Normal Forms - First, Second	1	3/11/22				
26	Third Normal Forms, BCNF	2	5/11/22				
<b>I MID EXAMINATIONS</b>							
27	Inclusion Dependences, Loss Less Join Decompositions	2	17/11/22				
28	Multi Valued Dependencies	2	19/11/22				
29	Fourth Normal Form	2	24/11/22				
30	Join Dependencies and Fifth Normal Form	2	26/11/22		1 & 2		
<b>No. of classes required to complete UNIT-III: 12</b>				<b>No. of classes taken:</b>			

## UNIT-IV: Transaction Processing Concepts, Concurrency Control Techniques & Crash Recovery

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31	<b>Transaction Processing Concepts:</b> Transaction System, Testing of Serializability	1	29/11/22		1 & 2	
32	Serializability of Schedules	1	01/12/22		1 & 2	
33	Conflict & View Serializability	1	02/12/22		1 & 2	
34	Recoverability, Deadlock Handling	1	03/12/22		1 & 2	
35	<b>Concurrency Control Techniques:</b> Concurrency Control	1	06/12/22		1 & 2	
36	Locking Techniques for Concurrency Control	1	08/12/22		1 & 2	
37	Time Stamping Protocols for Concurrency Control	1	09/12/22		1 & 2	
38	Validation Based Protocol	1	10/12/22		1 & 2	
39	Multiple Granularity	1	13/12/22		1 & 2	
40	Recovery with Concurrent Transactions	1	15/12/22		1 & 2	
41	Log Based Recovery, Checkpoints	1	16/12/22		1 & 2	
42	ARIES Algorithm	1	17/12/22		1 & 2	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

## UNIT-V: Physical Database Design & Interfacing and Interacting with NoSQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	<b>Physical Database Design:</b> Storage and file structure	1	20/12/22		1 & 2	
43	indexed files, hashed files	1	22/12/22		1 & 2	
44	B+ trees	1	23/12/22		1 & 2	
45	Files with dense index	1	24/12/22		1 & 2	
46	files with variable length records	1	27/12/22		1 & 2	
47	<b>Interfacing and interacting with NoSQL:</b> Introduction to NoSQL	2	30/12/22		1 & 2	
48	Storing and Accessing Data	1	31/12/22		1 & 2	
49	Storing Data in and Accessing Data from MongoDB	1	03/01/23		1 & 2	
50	Querying MongoDB	1	05/01/23		1 & 2	
<b>No. of classes required to complete UNIT-V: 10</b>				<b>No. of classes taken:</b>		

### Teaching Learning Methods

<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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):

<b>PO 1</b>	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	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.
<b>PO 3</b>	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.
<b>PO 4</b>	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.
<b>PO 5</b>	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
<b>PO 6</b>	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
<b>PO 7</b>	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.
<b>PO 8</b>	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
<b>PO 11</b>	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.
<b>PO 12</b>	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):**

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for employment and Higher studies in Artificial Intelligence and Data Science with ethical values.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>V. Sowjanya</b>	<b>Dr.M.Sitha Ram</b>	<b>Dr.K.Naga Prasanthi</b>	<b>Dr. O. Rama Devi</b>
<b>Signature</b>				



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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** V.Sowjanya

**Course Name & Code** : DATABASE MANAGEMENT SYSTEMS & 20CS07

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

**Credits:** 3

**Program/Sem/Sec** : B.Tech III Sem AI & DS-B

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

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<b>CO2</b>	Examine the relational model using Structured Query Language (SQL). <b>(Apply - L3)</b>
<b>CO3</b>	Employ principles of normalization for effective database design. <b>(Apply - L3)</b>
<b>CO4</b>	Demonstrate the necessity of transaction processing, Concurrency control mechanisms and recovery strategies in DBMS. <b>(Understand- L2)</b>
<b>CO5</b>	Describe file organization, indexing techniques and the competency in selecting NoSQL Database. <b>(Understand- L2)</b>

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

#### **TEXTBOOKS:**

**T1** Henry F. Korth, Abraham Silberschatz, S.Sudarshan, "Database System Concepts", McGrawHill, 6th edition, 2009.

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**R3** RamezElmasri, ShamkanthB.Navathe, "Fundamentals of Database Systems", Addison Wesley, 6th edition, 2010.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: DBMS Introduction & Data Modelling using the Entity Relationship Model

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	CEOs and COs discussion, <b>Introduction:</b> An overview of Database Management System	1	12/9/22		1 & 2	
2.	Database System Vs File System,	1	13/9/22		1 & 2	
3.	Database System Concepts	1	15/9/22		1 & 2	
4.	Three Schema Architecture,	1	17/9/22		1 & 2	
5.	DataModels	1	19/9/22		1 & 2	
6.	Database Schema and Instances, DataIndependence	1	20/9/22		1 & 2	
7.	Database Languages, Database Structure	1	22/9/22		1 & 2	
9.	<b>Data Modelling using the Entity Relationship Model:</b> ER model concepts, Notation for ER Diagram	1	24/9/22		1 & 2	
10.	Mapping Constraints, Keys	1	26/9/22		1 & 2	
11	Concepts of Super Key, Candidate Key, Primary Key	2	29/9/22		1 & 2	
12	Generalization, Aggregation	1	01/10/22		1 & 2	
13	Reduction of an ER Diagrams to Tables, Relationships of Higher Degree.	1	10/10/22		1 & 2	
<b>No. of classes required to complete UNIT-I: 14</b>				<b>No. of classes taken:</b>		

#### UNIT-II: Relational Data Model and Language & Introduction to SQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14	<b>Relational Data Model and Language:</b> Relational Data Model Concepts, Integrity Constraints	1	11/10/22		1 & 2	
15	Entity Integrity, Referential Integrity	1	13/10/22		1 & 2	
16	Key Constraints, Domain Constraints	1	15/10/22			
17	Relational Algebra	1	17/10/22			
18	<b>Introduction to SQL:</b> Characteristics of SQL, Advantage of SQL	1	18/10/22		1 & 2	
19	SQL Data types and Literals, Insert, Update and Delete Operations	1	20/10/22		1 & 2	
20	Tables, Views, and Indexes	1	22/10/22		1 & 2	
21	Nested Queries, Aggregate Functions	1	24/10/22		1 & 2	
22	Joins, Unions, Intersection, Minus	1	27/10/22		1 & 2	
23	Cursors in SQL, Triggers in SQL	1	29/10/22		1 & 2	
<b>No. of classes required to complete UNIT-II: 10</b>				<b>No. of classes taken:</b>		

#### UNIT-III: Normalization

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
24	<b>Normalization:</b> Functional Dependencies	1	31/10/22		1 & 2		
25	Normal Forms - First, Second	1	01/11/22				
26	Third Normal Forms, BCNF	2	5/11/22				
<b>I MID EXAMINATIONS</b>							
27	Inclusion Dependences, Loss Less Join Decompositions	2	15/11/22				
28	Multi Valued Dependencies	2	19/11/22				
29	Fourth Normal Form	2	22/11/22				
30	Join Dependencies and Fifth Normal Form	2	26/11/22		1 & 2		
<b>No. of classes required to complete UNIT-III: 12</b>				<b>No. of classes taken:</b>			

## UNIT-IV: Transaction Processing Concepts, Concurrency Control Techniques & Crash Recovery

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31	<b>Transaction Processing Concepts:</b> Transaction System, Testing of Serializability	1	28/11/22		1 & 2	
32	Serializability of Schedules	1	29/11/22		1 & 2	
33	Conflict & View Serializability	1	01/12/22		1 & 2	
34	Recoverability, Deadlock Handling	1	03/12/22		1 & 2	
35	<b>Concurrency Control Techniques:</b> Concurrency Control	1	05/12/22		1 & 2	
36	Locking Techniques for Concurrency Control	1	06/12/22		1 & 2	
37	Time Stamping Protocols for Concurrency Control	1	08/12/22		1 & 2	
38	Validation Based Protocol	1	10/12/22		1 & 2	
39	Multiple Granularity	1	12/12/22		1 & 2	
40	Recovery with Concurrent Transactions	1	13/12/22		1 & 2	
41	Log Based Recovery, Checkpoints	1	15/12/22		1 & 2	
42	ARIES Algorithm	1	17/12/22		1 & 2	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

## UNIT-V: Physical Database Design & Interfacing and Interacting with NoSQL

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	<b>Physical Database Design:</b> Storage and file structure	1	19/12/22		1 & 2	
43	indexed files, hashed files	1	20/12/22		1 & 2	
44	B+ trees	1	22/12/22		1 & 2	
45	Files with dense index	1	24/12/22		1 & 2	
46	files with variable length records	1	26/12/22		1 & 2	
47	<b>Interfacing and interacting with NoSQL:</b> Introduction to NoSQL	2	29/12/22		1 & 2	
48	Storing and Accessing Data	1	31/12/22		1 & 2	
49	Storing Data in and Accessing Data from MongoDB	1	02/01/23		1 & 2	
50	Querying MongoDB	1	03/01/23		1 & 2	
<b>No. of classes required to complete UNIT-V: 10</b>				<b>No. of classes taken:</b>		

### Teaching Learning Methods

<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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):

<b>PO 1</b>	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	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.
<b>PO 3</b>	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.
<b>PO 4</b>	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.
<b>PO 5</b>	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
<b>PO 6</b>	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
<b>PO 7</b>	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.
<b>PO 8</b>	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
<b>PO 11</b>	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.
<b>PO 12</b>	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):**

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for employment and Higher studies in Artificial Intelligence and Data Science with ethical values.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>V. Sowjanya</b>	<b>Dr.M.Sitha Ram</b>	<b>Dr.K.Naga Prasanthi</b>	<b>Dr. O. Rama Devi</b>
<b>Signature</b>				





# 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 ARTIFICIAL INTELLIGENCE & DATA SCIENCE

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr. V.Bhagya Lakshmi  
 Course Name & Code : Environmental Science & 20MC03  
 L-T-P Structure : 2-0-0 Credits : 0  
 Program/Sem/Sec : B.Tech., AI&DS., III-Sem., Sec-B., A.Y : 2021-22

#### PRE-REQUISITE:

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

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

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

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

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

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

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

#### TEXT BOOKS:

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

**REFERENCE BOOKS:**

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

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction of course and course objectives. Introduction of components of Environment	1	12-09-2022		2	
2.	Population explosion and variations among Nations.	1	15-09-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	19-09-2022		2	
4.	Environmental Hazards	1	22-09-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	26-09-2022		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

**UNIT-II: NATURAL RESOURCES AND CONSERVATION**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and classification of Natural resources, Forest Resources,	1	29-10-2022		2	
2.	Water Resources	1	10-10-2022		2	
3.	Mineral Resources	1	13-10-2022		2	
4.	Food Resources	1	17-10-2022		2	
5.	Food Resources	1	20-10-2022		2	
6.	Mineral Resources	1	27-10-2022		2	
No. of classes required to complete UNIT-II: 6				No. of classes taken:		

**UNIT-III: ECOLOGY AND BIODIVERSITY**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, structure and functions of an ecosystem. Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	31-10-2022		2	

2.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Biogeographical classification of India. India as a mega diversity nation. Values of biodiversity-Direct and Indirect values. Threats to biodiversity;	1	03-11-2022		2
3.	<b>I MID EXAMINATION</b>	1	07-11-2022		2
4.	<b>I MID EXAMINATION</b>	1	10-11-2022		
5.	<b>Case Studies</b>	1	14-11-2022		
6.	Man and wild life conflicts. Endangered and endemic species of India	1	17-11-2022		2,3
7.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	21-11-2022		2
No. of classes required to complete UNIT-III: 6				No. of classes taken:	

#### UNIT-IV : ENVIRONMENTAL POLLUTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Air Pollution	1	24-11-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	28-11-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		01-12-2022		2	
4.	Noise Pollution		05-12-2022		2	
5.	Solid Waste Management	1	08-12-2022		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	12-12-2022		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

#### UNIT-V : ENVIRONMENTAL MANAGEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Sustainable Development	1	15-12-2022		2	
2.	Climate disruption-Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	19-12-2022		2,3	
3.	Environmental Impact Assessment (EIA)	1	22-12-2022		2	
4.	Green building, Environmental Law	1	26-12-2022		2	
5.	Revision	1	26-12-2022		3	
6.	II MID EXAMINATIONS	1	02-01-2023			
7.	II MID EXAMINATIONS	1	05-01-2023			
No. of classes required to complete UNIT-V: 04				No. of classes taken:		

#### Teaching Learning Methods

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

### **PART-C**

#### **EVALUATION PROCESS (R17 Regulation):**

<b>Evaluation Task</b>	<b>Marks</b>
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))	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
Total Marks = CIE + SEE	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. V.Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. K. VINAYA SREE BAI

Course Name & Code : Object Oriented Programming Lab (20CS57)

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

Credits: 1.5

Program/Sem/Sec : II B.Tech III Sem AI & DS - B

A.Y.: 2022-23

**PRE-REQUISITE:** Programming for Problem Solving using C and Data structures

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**The objective of the course is to apply the constructs of Java programming language along with built-in facilities to create different applications such as console & graphical user interfaces. They will be applying knowledge of object-oriented programming, collection framework to perform all operations on data.

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

CO 1	Solve basic mathematical problems using fundamentals of Java and its objectoriented principles. <b>(Apply – L3)</b>
CO 2	Implement multithreading and exception handling mechanisms. <b>(Apply – L3)</b>
CO 3	Develop GUI applications and basic data structures using collection framework. <b>(Apply – L3)</b>
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	-	-	-	-	-	-	-	-	-	-	3	1	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	3	1	-
CO3	-	1	2	-	-	-	-	-	-	-	-	-	3	1	-
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).

#### TEXTBOOKS:

T1 Herbert Schildt, “Java: The complete reference”, TMH Publications, 7th edition, 2006

T2 Cay S. Horstmann, “Core Java Volume I – Fundamentals”, Pearson, Eleventh edition, 2018

#### REFERENCE BOOKS:

R1 Dr. R. Nageswara Rao, “Core JAVA: An Integrated Approach”, Dreamtech Press, 1st Edition, 2008.

R2 E. Bala Guru Swamy, “Programming with JAVA”, TMH Publications, 2<sup>nd</sup> Edition, 2000.

R3 Patrick Niemeyer & Jonathan Knudsen, “Learning JAVA”, O’REILLY Publications, 3<sup>rd</sup> Edition, 2005.

R4 Benjamin J Evans & David Flanagan, “JAVA-in a Nutshell – A desktop quick reference”, O’REILLY Publications, 6<sup>th</sup> Edition, 2014.

## 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	Introduction lab on C++	3	16-9-2022		TLM4	
2	Java Basic programs	3	23-9-2022		TLM4	
3	Classes and objects	3	30-9-2022		TLM4	
4	Constructor & Parameter Passing	3	14-10-2022		TLM4	
5	Static keyword, Strings	3	21-10-2022		TLM4	
6	Inheritance & Polymorphism	3	28-10-2022		TLM4	
7	Dynamic method dispatch & Interfaces	3	4-11-2022		TLM4	
8	Packages & Exception Handling	3	18-11-2022		TLM4	
9	Multithreading programs	3	25-11-2022		TLM4	
10	Collections, Framework	3	2-12-2022		TLM4	
11	AWT Controls	3	9-12-2022		TLM4	
12	AWT Controls	3	16-12-2022		TLM4	
13	Event Handling	3	23-12-2022		TLM4	
14	Internal Exam	3	30-12-2022		TLM4	

### **Teaching Learning Methods**

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

## PART-C

**EVALUATION PROCESS (R20 Regulations):** According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows

**Continuous Internal Evaluation (CIE):** The Continuous Internal Evaluation (CIE) is based on the following parameters:

Parameter	Marks
Day to Day work	5
Record	5
Internal Test	5
<b>Total</b>	<b>15</b>

**Semester End Examinations (SEE):** The Semester End examinations (SEE) for laboratory courses shall be jointly conducted by internal and external examiners with 3 hours' duration and evaluated for 35 marks. The performance of the student shall be evaluated as per the parameters indicated below:

Parameter	Marks
Procedure/Algorithm	5
Experimentation/Program execution	10
Observations/Calculations/Validation	10
Result/Inference	5
Viva voce	5
<b>Total</b>	<b>35</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and teamwork:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.



<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.
--------------	--

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>Ms. K. Vinaya Sree Bai</b>	<b>Mr. N. Srinivasa Rao</b>	<b>Dr. K. Naga Prashanthi</b>	<b>Dr. O. Rama Devi</b>
<b>Signature</b>				



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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. K. VINAYA SREE BAI

Course Name & Code : Object Oriented Programming (20CS09)

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

Credits: 3

Program/Sem/Sec : II B.Tech III Sem AI & DS - B

A.Y.: 2022-23

**PREREQUISITE:** Programming for Problem Solving using C.

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The objective of the course is to learn the constructs of the Java programming language along with built-in facilities to create different applications such as console & graphical user interfaces. In the process of learning the language, they will be applying knowledge of object oriented programming; they will get the fundamental knowledge reason collection framework.

CO1	Demonstrate the fundamentals of object-oriented programming and basic building blocks of Java. (Understand- L2)
CO2	Apply object-oriented programming principles for the development of reusable applications. (Apply - L3)
CO3	Understand the importance of abstraction, user defined package creation and handling different exceptions. (Understand- L2)
CO4	Develop multitasking applications using JAVA multithreaded programming and perform different operations upon various data structures by using collection framework. (Apply – L3)
CO5	Develop GUI applications using AWT (Abstract Window Toolkit). (Apply- L3)

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

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

#### **TEXTBOOKS:**

T1 Herbert Schildt, "Java: The complete reference", TMH Publications, 7<sup>th</sup> Edition, 2006.

T2 Cay S. Horstmann, "Core Java Volume I – Fundamentals", Pearson, Eleventh Edition, 2018.

#### **REFERENCE BOOKS:**

R1 Dr. R. Nageswara Rao, "Core JAVA: An Integrated Approach", Dreamtech Press, 1st Edition, 2008.

R2 E. Bala Guru Swamy, "Programming with JAVA", TMH Publications, 2<sup>nd</sup> Edition, 2000.

R3 Patrick Niemeyer & Jonathan Knudsen, "Learning JAVA", O'REILLY Publications, 3<sup>rd</sup> Edition, 2005.

R4 Benjamin J Evans & David Flanagan, "JAVA-in a Nutshell – A desktop quick reference", O'REILLY Publications, 6<sup>th</sup> Edition, 2014.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Introduction to OOP:

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.	<b>Introduction to OOP</b>	1	12/9/2022		1 & 2	
2.	Programming paradigms	1	13/9/2022		1 & 2	
3.	Procedural Programming language	1	14/9/2022		1 & 2	
4.	Object Oriented Language	1	14/9/2022		1 & 2	
5.	PPL vs OOP, Principles of OOP	1	15/9/2022		1 & 2	
6.	<b>Introduction to JAVA</b>	1	17/9/2022		1 & 2	
7.	Java Features	1	17/9/2022		1 & 2	
8.	Data types, Variables	1	20/9/2022		1 & 2	
9.	Keywords	1	21/9/2022		1 & 2	
10.	Operators	1	23/9/2022		1 & 2	
11.	Control Statements	1	24/9/2022		1 & 2	
12.	<b>Introduction to Classes and Object</b>	1	27/9/2022		1 & 2	
13.	Class Definition	1	28/9/2022		1 & 2	
14.	Variables, Declaring Objects	1	30/9/2022		1 & 2	
15.	Methods	1	1/10/2022		1 & 2	
16.	Constructors and its types	1	1//10/2022		1 & 2	
17.	Constructors, this keyword	1	11/10/2022		1 & 2	
<b>No. of classes required to complete UNIT-I: 17</b>				<b>No. of classes taken:</b>		

#### UNIT-II: Classes and Objects, Inheritance & Polymorphism

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.	<b>Introduction to classes &amp; objects</b>	1	12/10/2022		1 & 2	
19.	Overloading methods, Constructors	1	12/10/2022		1 & 2	
20.	Parameter Passing, returning objects	1	14/10/2022		1 & 2	
21.	Recursion	1	14/10/2022		1 & 2	
22.	Access Control	1	18/10/2022		1 & 2	
23.	Nested and inner classes	1	18/10/2022		1 & 2	
24.	final keyword	1	19/10/2022		1 & 2	
25.	static keyword	1	21/10/2022		1 & 2	
26.	Variable, Command line arguments	1	22/10/2022		1 & 2	
27.	<b>Inheritance and Polymorphism</b>	1	25/10/2022		1 & 2	
28.	Types of Inheritance	1	25/10/2022		1 & 2	
29.	Types of Inheritance with examples	1	26/10/2022		1 & 2	
30.	super keyword	1	28/10/2022		1 & 2	
31.	Polymorphism(overloading & overriding)	1	28/10/2022		1 & 2	
32.	Dynamic method dispatch	1	29/10/2022		1 & 2	
33.	Abstract class using final with inheritance	1	29/10/2022		1 & 2	
34.	<b>String handling classes</b>	1	1/11/2022		1 & 2	
35.	String Buffer	1	1/11/2022		1 & 2	
36.	String Buffer, String Tokenizer	1	1/11/2022		1 & 2	
<b>No. of classes required to complete UNIT-II: 19</b>				<b>No. of classes taken:</b>		

**UNIT-III: Interfaces and Packages, 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
37.	Interface methods	1	2/11/2022		1 & 2	
38.	Inheritance in interfaces	1	2/11/2022		1 & 2	
<b>39.</b>	<b>API: Built-in JAVA packages</b>	1	4/11/2022		1 & 2	
40.	Creating and managing user defined packages	1	4/11/2022		1 & 2	
41.	Creating and managing user defined packages	1	5/11/2022		1 & 2	
42.	Importance of CLASSPATH.	1	5/11/2022		1 & 2	
<b>43.</b>	<b>Exception Handling Introduction</b>	1	15/11/2022		1 & 2	
44.	Exception Handling hierarchy	1	15/11/2022		1 & 2	
45.	Importance of try with example	1	16/11/2022		1 & 2	
46.	Catch, throw, throws	1	16/11/2022		1 & 2	
47.	Finally, Block creation of user-defined Exceptions	1	18/11/2022		1 & 2	
48.	Block creation of user-defined Exceptions, Assertions.	1	19/11/2022		1 & 2	
<b>No. of classes required to complete UNIT-III: 12</b>				<b>No. of classes taken:</b>		

**UNIT-IV: Multithreading, Collection Framework:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
<b>49.</b>	<b>Introduction of thread</b>	1	22/11/2022		1 & 2	
50.	Thread life cycle, creation of threads	1	23/11/2022		1 & 2	
51.	Naming a thread	1	25/11/2022		1 & 2	
52.	Joining a thread, Thread priorities	1	26/11/2022		1 & 2	
53.	Thread priorities	1	29/11/2022		1 & 2	
54.	Daemon thread	1	30/11/2022		1 & 2	
55.	Thread pool	1	2/12/2022		1 & 2	
56.	Thread group	1	3/12/2022		1 & 2	
57.	Thread Synchronization	1	6/12/2022		1 & 2	
58.	Inter thread communication	1	7/12/2022		1 & 2	
<b>59.</b>	<b>Collection Framework: Introduction</b>	1	9/12/2022		1 & 2	
60.	Generics, Collection framework hierarchy	1	13/12/2022		1 & 2	
61.	List, set	1	14/12/2022		1 & 2	
62.	Queue and map	1	16/12/2022		1 & 2	
<b>No. of classes required to complete UNIT-IV: 14</b>				<b>No. of classes taken:</b>		

**UNIT-V: AWT, Event 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
<b>63.</b>	<b>AWT Introduction, Hierarchy</b>	1	17/12/2022		1 & 2	
64.	Components & Containers	1	20/12/2022		1 & 2	
65.	Button, Label, Text Field	1	21/12/2022		1 & 2	
66.	Checkbox, Choice, List	1	23/12/2022		1 & 2	
67.	Canvas, Scrollbar, Menus	1	24/12/2022		1 & 2	
68.	Layout Managers	1	27/12/2022		1 & 2	
<b>69.</b>	<b>Event Handling: Event Delegation Model, Event Classes</b>	1	28/12/2022		1 & 2	
70.	Listener Interfaces, Key Listener and Window Listener	1	30/12/2022		1 & 2	
71.	Adapter Classes, close AWT window	1	31/12/2022		1 & 2	
<b>No. of classes required to complete UNIT-V: 09</b>				<b>No. of classes taken:</b>		

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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))	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
Total Marks = CIE + SEE	<b>100</b>

### PART-D

#### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	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.
<b>PO 3</b>	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.
<b>PO 4</b>	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.
<b>PO 5</b>	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
<b>PO 6</b>	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
<b>PO 7</b>	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.
<b>PO 8</b>	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

<b>PO 10</b>	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to
<b>PO 11</b>	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.
<b>PO 12</b>	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):**

<b>PSO 1</b>	To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.
<b>PSO 2</b>	To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.
<b>PSO 3</b>	To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>Ms. K. Vinaya Sree Bai</b>	<b>Mr. N. Srinivasa Rao</b>	<b>Dr. K. Naga Prashanthi</b>	<b>Dr. O. Rama Devi</b>
<b>Signature</b>				