



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE HANDOUT

### PART-A

Name of Course Instructor : Dr. A. Rami Reddy  
Course Name & Code : Linear Algebra & Numerical Applications, 17FE11  
L-T-P Structure : 3-2-0 Credits : 4  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- A A.Y : 2020-2021

**PRE-REQUISITE:** Basics of Matrix Algebra

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The objective of this course is to introduce the Matrix Algebra. The students will also gain the knowledge of numerical techniques for solving the equations and fitting of various curves.

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

CO1	Distinguish among the pros and cons between the Row operation methods and Iterative methods in solving system of linear equations.
CO2	Compute the Eigen values and Eigen vectors and powers, Inverse of a square matrix through Cayley – Hamilton theorem
CO3	Reducing the given Matrix into Diagonal form using various transformations and Transforming the Quadratic form into canonical form and identify its nature.
CO4	Application of numerical techniques fir Algebraic and Transcendental equations.
CO5	Use numerical methods for the solution of the liner system of equations and estimate the unknown dependent variables using curve fitting methods.

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

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	1	-	-	-	-	-	-	-	1
CO2	3	2	-	1	-	-	-	-	-	-	-	1
CO3	3	2	-	1	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1
CO5	3	2	-	-	-	-	-	-	-	-	-	1

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

#### TEXT BOOKS:

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

#### BOS APPROVED REFERENCE BOOKS:

- R1** Michael D. Greenberg , “Advanced Engineering Mathematics”, 2<sup>nd</sup> Edition, TMH, New Delhi, 2011.
- R2** Erwin Kreyszig, “Advanced Engineering Mathematics”, 8<sup>th</sup> Edition, John Wiley & Sons, New Delhi, 2011.
- R3** W.E. Boyce, R.C.Diprima, ”Elementary Differential Equations”, 7<sup>th</sup> Edition, John Wiley and sons, New Delhi, 2001.

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN):**

#### **UNIT-I: System of Linear Equations**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course & Co's	1	16/4/21			
2.	Introduction to Unit-I	1	17/4/21		TLM1	
3.	Matrices - Rank	1	19/4/21		TLM1	
4.	Echelon form	1	20/4/21		TLM1	
5.	Tutorial-1	1	23/4/21		TLM3	
6.	Echelon form	1	24/4/21		TLM1	
7.	Normal form	1	26/4/21		TLM1	
8.	Normal form through PAQ	1	27/4/21		TLM1	
9.	Solution of Linear Systems	1	28/4/21		TLM1	
10.	Tutorial-2	1	30/4/21		TLM3	
11.	Non Homogeneous system of equations	1	01/5/21		TLM1	
12.	Non Homogeneous system of equations	1	03/5/21		TLM1	
13.	Homogeneous system of equations	1	04/5/21		TLM1	
14.	Assignment/ Quiz Unit-I	1	05/5/21		TLM6	
No. of classes required to complete Unit-I :			14	No. of classes taken:		

#### **UNIT-II: Eigen Values and Eigen Vectors**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Unit II	1	07/5/21		TLM1	
2.	Eigen values – Eigen Vectors	1	08/5/21		TLM1	
3.	Properties	1	10/5/21		TLM1	
4.	Properties	1	11/5/21		TLM1	
5.	Eigen values – Eigen Vectors	1	12/5/21		TLM1	
6.	Eigen values – Eigen Vectors	1	15/5/21		TLM1	
7.	Tutorial-3	1	17/5/21		TLM3	

8.	Cayley Hamilton Theorem	1	18/5/21		TLM1
9.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	19/5/21		TLM1
10.	Tutorial-4	1	21/5/21		TLM3
11.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	22/5/21		TLM1
12.	Assignment/ Quiz Unit- II	1	24/5/21		TLM6
No. of classes required to complete Unit-II:			12	No. of classes taken:	

### UNIT-III: Linear Transformation and Diagonalization

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 Unit III	1	1/06/21		TLM1	
2.	Linear transformation of Matrices	1	2/06/21		TLM1	
3.	Orthogonal transformation of Matrices	1	4/06/21		TLM1	
4.	Tutorial-5	1	5/06/21		TLM3	
5.	Similarity of Matrices	1	7/06/21		TLM1	
6.	Diagonalization of a Matrix	1	8/06/21		TLM1	
7.	Orthogonal reduction of real symmetric matrices	1	9/06/21		TLM1	
8.	Reduction of quadratic form to canonical form	1	11/06/21		TLM1	
9.	Reduction of quadratic form to canonical form-Rank-Positive, Negative	1	12/06/21		TLM1	
10.	Definite-Semi definite-Index, Signature	1	14/06/21		TLM1	
11.	Definite-Semi definite-Index, Signature	1	15/06/21		TLM1	
12.	Assignment/Quiz Unit-III	1	16/06/21		TLM6	
13.	Tutorial-6	1	18/06/21		TLM3	
No. of classes required to complete Unit-III:			13	No. of classes taken:		

### UNIT-IV: Solution of Algebraic and Transcendental equations & Interpolation and finite Differences

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 Unit IV	1	19/06/21		TLM1	
2.	False Position method	1	21/06/21		TLM1	
3.	Newton- Raphson Method in one variable	1	22/06/21		TLM1	
4.	Tutorial-7	1	23/06/21		TLM3	

5.	Introduction – Finite differences	1	25/06/21		TLM1
6.	Forward Differences- Backward differences –Central differences	1	26/06/21		TLM1
7.	Forward Differences- Backward differences –Central differences	1	28/06/21		TLM1
8.	Symbolic relations and separation of symbols	1	29/06/21		TLM1
9.	Tutorial-8	1	30/06/21		TLM3
10.	Newton’s formulae for interpolation	1	02/07/21		TLM1
11.	Lagrange’s Interpolation	2	03/07/21 05/07/21		TLM1
12.	Assignment/Quiz Unit-IV	1	06/07/21		TLM6
No. of classes required to complete Unit-IV:			13	No. of classes taken:	

### UNIT-V : Numerical Solution of Linear System of Equations& Curve Fitting

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to UNIT V	1	07/07/21			
2.	Gauss –Seidal method	2	09/07/21 10/07/21			
3.	Gauss Jacobi Method	2	12/07/21 13/07/21			
4.	Determination of EIGEN values by iteration.	1	14/07/21			
5.	Fitting of a Straight line	1	16/07/21			
6.	Tutorial-9	1	17/07/21			
7.	Fitting of a second degree polynomial	1	19/07/21			
8.	Fitting of exponential curves	1	20/07/21			
9.	Fitting of a power curve	1	21/07/21			
10.	Assignment/Quiz UNIT-V	1	23/07/21			
11.	Tutorial-10	1	24/07/21			
No. of classes required to complete UNIT-V:			13	No. of classes taken:		

### Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Solving System of Equations using other methods	1	24/07/21			
No. of classes required to complete UNIT-V:				No. of classes taken:		

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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks = 75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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.

Course Instructor  
(Dr. A. Rami Reddy)

Course Coordinator  
(Dr. K. R. Kavitha)

Module Coordinator  
(Dr. A. Rami Reddy)

HOD  
(Dr. A. Rami Reddy)



# 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.

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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : Dr Y.Vijay Bhaskar Reddy

**Course Name & Code** : OOPs through JAVA (17CI07)

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

Credits : 3

**Program/Sem/Sec** : B.Tech., CSE, IV-Sem., Section – A A.Y : 2020 - 2021

**PRE-REQUISITE:** Knowledge of Procedural Programming Language

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

This course concentrates on the methodological and technical aspects of software design and programming based on OOP and Acquire the basic knowledge and skills necessary to implement object-oriented programming techniques in software development through JAVA and to know about the importance of GUI based applications and the development of those Applications through JAVA and getting sufficient knowledge to enter the job market related to web development.

#### **COURSE OUTCOMES (COs):**

At the end of the course, students are able to

CO1	<b>Identify</b> Object Oriented concepts through constructs of JAVA.
CO2	<b>Analyze</b> the role of Inheritance, Polymorphism and implement Packages, Interfaces in program design using JAVA.
CO3	<b>Explore</b> Exception handling and Multi-threading concepts in program design using JAVA.
CO4	<b>Develop</b> GUI based applications using Applet class and explore the concept of Event Handling using JAVA.
CO5	<b>Design</b> some examples of GUI based applications using AWT controls and Swings.

#### **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	1	2	-	-	-	-	-	-	-	-	1	3	-	1
CO2	3	3	2	-	1	-	-	-	-	-	-	1	3	-	1
CO3	3	2	3	-	1	-	-	-	-	-	-	1	3	-	1
CO4	3	2	3	-	1	-	-	-	-	-	-	1	3	-	1
CO5	3	2	2	-	1	-	-	-	-	-	-	1	3	3	1

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

1- Slight (Low),

2 – Moderate (Medium),

3 - Substantial (High).

**TEXT BOOKS:**

**T1** Herbert Schildt, “Java: The complete Reference”, TMH Publications, 7<sup>th</sup> edition, 2006.

**REFERENCE BOOKS:**

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

**R2** E.Balaguruswamy, “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.

**R5** David Flanagan, “Java Examples in a nutshell – A Tutorial companion to java in a nutshell”, O’REILLY Publications, 3<sup>rd</sup> Edition, 2004.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction to Java Language and Classes**

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 Java Programming Java Basic Terminology ( JDK, JRE, JVM)	1	14.04.2021		TLM1/ TLM2	
2.	Drawbacks of POP, Object Oriented paradigm, OOP Concept	1	15.04.2021		TLM1/ TLM2	
3.	Java Buzzwords, Byte Code, Simple types	1	16.04.2021		TLM1/ TLM2	
4.	Arrays, Type Conversion and Casting	1	22.04.2021		TLM1/ TLM2	
5.	Simple Java Programs , Class Fundamentals, Declaring Objects, Access Control and recursion, Constructors	1	23.04.2021		TLM1	
6.	Garbage Collection, Programs on String and String Buffer classes and Wrapper classes	1	28.04.2021		TLM1	
7.	Tutorial – 1 / Assignment - 1	1	29.04.2021		TLM 3	
No. of classes required to complete UNIT-I: 07				No. of classes taken:		

**UNIT-II: Inheritance & Polymorphism, Packages and Interfaces**

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.	Inheritance Basics, Super Keyword, Multilevel Hierarchy,	1	30.04.2021		TLM1/ TLM2	
2.	Method Overloading & Method Overriding	1	05.05.2021		TLM1/ TLM2	
3.	Dynamic method dispatch, Abstract class, Object class and final keyword.	1	06.05.2021		TLM1/ TLM2	



4.	Package definition, Accessing package, understanding CLASSPATH	1	07.05.2021		TLM1/ TLM2	
5.	Importing Packages, java.util package	1	12.05.2021		TLM1/ TLM2	
6.	Defining, Implementing and Applying Interfaces	1	13.05.2021		TLM1/ TLM2	
7.	Variables in interface and extending interfaces, Differences between classes and interfaces	1	19.05.2021		TLM1/ TLM2	
8.	Tutorial – 2 / Assignment - 2	1	20.05.2021		TLM3	
No. of classes required to complete UNIT-II: 08				No. of classes taken:		

### UNIT-III: Exception Handling, Multithreading

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.	Exception Handling Fundamentals, Exception types	1	21.05.2021		TLM1/ TLM2	
2.	Usage of try & catch , throws and finally	1	26.05.2021		TLM1/ TLM2	
3.	Java Built-in Exceptions	1	27.05.2021		TLM1/ TLM2	
4.	Differences between multi-threading and multi-tasking.	1	28.05.2021		TLM1/ TLM2	
5.	Java thread model Creating thread	1	02.06.2021		TLM1/ TLM2	
6.	Multiple threads, Synchronizing threads	1	03.06.2021		TLM1/ TLM2	
7.	Tutorial – 3 / Assignment - 3	1	04.06.2021		TLM3	
No. of classes required to complete UNIT-III: 07				No. of classes taken:		

### UNIT-IV : Applet class and 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
1.	Concepts of Applets, Differences between Applets and Applications	1	09.06.2021		TLM1/ TLM2	
2.	Applet Architecture, skeleton and creation.	1	10.06.2021		TLM1/ TLM2	
3.	Passing parameters to applets and working with graphics class.	1	11.06.2021		TLM1/ TLM2	
4.	Event handling mechanisms, Events and Event sources.	1	16.06.2021		TLM1/ TLM2	
5.	Event class, Listener interface, Delegation event model.	1	17.06.2021		TLM1/ TLM2	
6.	Keyboard and Mouse Events, Adapter class, Inner class.	1	18.06.2021		TLM1/ TLM2	
7.	Tutorial – 4 / Assignment - 4	1	23.06.2021		TLM3	
No. of classes required to complete UNIT-IV: 07				No. of classes taken:		

**UNIT-V : AWT Controls and Introduction to Swings**

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.	Label, button, Scrollbars, Text Components	1	24.06.2021		TLM1/ TLM2	
2.	Check Box, Check Box groups, choices, controls, lists	1	25.06.2021		TLM1/ TLM2	
3.	Scrollbar, Text field, Layout Managers – border, grid, flow	1	30.06.2021		TLM1/ TLM2	
4.	Introduction to swing, Key features, Limitations of AWT	1	07.07.2021		TLM1/ TLM2	
5.	Components and Containers, Swing packages.	1	08.07.2021		TLM1/ TLM2	
6.	Creating Swing applet.	1	09.07.2021		TLM1/ TLM2	
7.	JApplet class, JComponents – Labels, Text fields, buttons	1	14.07.2021		TLM1/ TLM2	
8.	Jbutton class, Tabbed Panes, Scroll Panes, Tables	1	15.07.2021		TLM1/ TLM2	
9.	Tutorial – 5 / Assignment - 5	1	16.07.2021		TLM3	
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

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

**PART-C****EVALUATION PROCESS (R17 Regulations):**

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

Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
DR.Y.V.B. REDDY	DR.Y.V.BHASKAR REDDY	DR. D.VEERAI AH	DR. D.VEERAI AH

**COURSE HANDOUT****PART-A**

Name of Course Instructor : Mr. N V NAIK  
Course Name & Code : Design and Analysis of Algorithms- 17CI08  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- A A.Y : 2020-21

**PRE-REQUISITE:** Basic of Programming language and Data structure

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**

Students undergoing this course are expected to:

Explain the fundamental concepts of various algorithm design techniques. Make the students familiar to conduct performance evaluation of algorithms. Expertise the students with the various existing algorithm design techniques. Motivate the students to design a new algorithm for various problems.

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

<b>CO 1</b>	Identify the basic properties and analysis methods of algorithms and design divide and conquer paradigm for solving a few example problems and analyze them.
<b>CO 2</b>	Design Greedy algorithms for knapsack problem, minimum cost spanning tree, single source shortest path problem and analyze them.
<b>CO 3</b>	Apply dynamic programming paradigm to solve travelling sales person problem, 0/1 knapsack problem, Optimal binary search tree.
<b>CO 4</b>	Apply Backtracking search methods on state space trees for few example problems
<b>CO 5</b>	Analyze branch and bound search methods through problems such as 0/1 knapsack problem, Travelling salesperson problem.

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

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

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

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

**TEXT BOOKS:**

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

T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson , 2007.

**REFERENCE BOOKS:**

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

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

**PART-B**

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

**UNIT -I: INTRODUCTION**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to course	1	12-04-21		TLM1	
2.	Algorithm definition and Specifications	1	15-04-21		TLM1	
3.	Performance Analysis	1	19-04-21		TLM1	
4.	Time Complexity and space complexity	1	20-04-21		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	22-04-21		TLM1 /TLM2	
6.	Divide & Conquer Technique: General Method	1	26-04-21		TLM1 /TLM2	
7.	Binary Search and its analysis	1	27-04-21		TLM1 /TLM2	
8.	Finding Maximum and Minimum and its Analysis	1	29-04-21		TLM1 /TLM2	
9.	Merge sort and its Analysis	1	03-05-21		TLM1 /TLM2	
10.	Quick Sort algorithm and its analysis	1	04-05-21		TLM1 /TLM2	
11.	Assignment-1/Tutorial-1	1	06-05-21		TLM 3	
No. of classes required to complete UNIT-I : <b>11</b>				No. of classes taken:		

**UNIT –II: Greedy Method**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
12.	Greedy Method – Introduction, General method	1	10-05-21		TLM1/ TLM2	
13.	Knapsack problem , Example problem	1	11-05-21		TLM1 /TLM2	
14.	Job sequencing with deadlines, Example problem	1	13-05-21		TLM1 /TLM2	
15.	Minimum cost spanning trees, example problem	1	17-05-21		TLM1 /TLM2	
16.	Optimal storage on tapes, Example problem	1	18-05-21		TLM1 /TLM2	
17.	Single source Shortest path problem	1	20-05-21		TLM1 /TLM2	
18.	Assignment-2/Tutorial-2	1	20-05-21		TLM 3	
No. of classes required to complete <b>UNIT-2 : 06</b>				No. of classes taken:		

**UNIT –III: DYNAMIC PROGRAMMING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Dynamic Programming- General method	1	31-05-21		TLM1	
20.	Multistage Graph, Example problem	1	01-06-21		TLM1 /TLM2	
21.	All pairs Shortest path, Example problem	1	03-06-21		TLM1 /TLM2	
22.	Optimal Binary Search Tree , Example problem	1	07-06-21		TLM1 /TLM2	
23.	0/1 Knapsack Problem	1	08-06-21		TLM1 /TLM2	
24.	Travelling Sales Person Problem	1	10-06-21		TLM1	
25.	Single source shortest path problem, Example Problem	1	14-06-21		TLM1	
26.	Reliability design, Example Problem	1	15-06-21		TLM1	
27.	Tutorial-3/ Assignment-3	1	15-06-21		TLM 3	
No. of classes required to complete <b>UNIT-3 : 08</b>				No. of classes taken:		

**UNIT –IV: BACK TRACKING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	General Method	1	17-06-21		TLM1	
29.	The 8-Queens problem	1	21-06-21		TLM1 /TLM2	
30.	Sum of subsets problem	2	22-06-21 24-06-21		TLM1 /TLM2	
31.	Graph coloring problem	1	28-06-21		TLM1 /TLM2	
32.	Hamiltonian cycles	1	29-06-21		TLM1 /TLM2	
33.	Tutorial-4/Assignment-4	1	01-07-21		TLM 3	
No. of classes required to complete UNIT-4 : 08						

**UNIT-V: BRANCH AND BOUND**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Branch and Bound- General method	1	05/07/21		TLM1	
35.	LC Branch and bound solution for Travelling Sales Person Problem	2	06/07/21 08/07/21		TLM1 /TLM2	
36.	LC Branch and bound solution 0/1 Knapsack problem	2	12/07/21 13/07/21		TLM1 /TLM2	
37.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	15/07/21		TLM1 /TLM2	
38.	FIFO Branch and bound solution 0/1 Knapsack problem	1	19/07/21		TLM1 /TLM2	
39.	Assignment-5 /Tutorial-5	1	20/07/21		TLM 3	
No. of classes required to complete UNIT-5 : 09						

**Contents beyond the Syllabus**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Master theorem, Huffman Coding	1	22-07-21		TLM1 /TLM4	

<b>Teaching Learning Methods</b>			
<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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100



## PART-D

### PROGRAMME OUTCOMES (POs):

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

Course Instructor  
Mr. N V NAIK

Course Coordinator  
Mr. G V SURESH

Module Coordinator  
Mr. G V SURESH

HOD  
Dr. D. Veeraiah



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

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

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

#### PRE-REQUISITE:

Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

#### COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course enables the students to know about Basic concepts of DBMS, Database Languages, Database Design, Normalization Process, Transaction Processing, and Indexing.

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

<b>CO1</b>	<b>Outline</b> the components of DBMS & design database using ER model
<b>CO2</b>	<b>Construct</b> database using SQL and extract data from database using Relational algebra & SQL queries.
<b>CO3</b>	<b>Apply</b> the normalization process for effective database design
<b>CO4</b>	<b>Analyze</b> components of transaction processing, Concurrency control mechanisms and recovery strategies of DBMS
<b>CO5</b>	<b>Evaluate</b> different File organization & Indexing Techniques

#### 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>	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
<b>CO2</b>	3	3	-	-	1	-	-	-	-	-	-	-	2	3	-
<b>CO3</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	3	-
<b>CO4</b>	2	1	2	-	-	-	-	-	-	-	-	-	1	3	-
<b>CO5</b>	2	1	2	-	-	-	-	-	-	-	-	-	1	3	-

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

1- Low

2 –Medium

3 High

#### TEXT BOOKS:

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

Ramez Elmasri, Shamkanth B.Navathe, "Fundamentals of Database Systems", Addison

T2 Wesley, 6 thedition, 2010.

**REFERENCE BOOKS:**

- R1** Raghu Ramakrishnan, Johannes Gehrke, “Database Management System”, McGraw Hill, 3 rd edition, 2000.
- R2** Date C J, “An Introduction to Database System”, Pearson Education, 8th edition, 2003
- R3** Sharad Maheshwari, Ruchin Jain, “DBMS: Complete Practical Approach”, Firewall Media, New Delhi, 2005
- R1** Raghu Ramakrishnan, Johannes Gehrke, “Database Management System”, McGraw Hill, 3 rd edition, 2000.

**PART-B**

**COURSE DELIVERY PLAN (LESSON PLAN):**

**UNIT –I: Introduction & Data modeling 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.	Introduction, An overview of database management system	1	12-04-2021		TLM2	
2.	Database system Vs file system	1	15-04-2021		TLM2	
3.	Database system concepts and architecture	1	16-04-2021		TLM2	
4.	Data models schema and instances	1	17-04-2021		TLM2	
5.	Data independence and data base language and interfaces	1	21-04-2021		TLM2	
6.	Data definitions language, DML, Overall Database Structure	1	22-04-2021		TLM2	
7.	ER model concepts-notation for ER diagram	1	23-04-2021		TLM2	
8.	Mapping constraints, keys	1	24-04-2021		TLM2	
9.	Concepts of Super Key, candidate key, primary key, Generalization, aggregation	1	28-04-2021		TLM2	
10.	Reduction of an ER diagrams to tables, Extended ER model, Relationships of higher degree	1	29-04-2021		TLM2	
11.	Unit review and Discussion	1	30-04-2021		TLM2	
12.	Assignment – 1	1	01-05-2021		TLM2	
No. of classes required to		13				

complete UNIT-I			
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### 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
13.	Relational data model concepts	1	05-05-2021		TLM2	
14.	Integrity constraints: entity integrity, referential integrity	1	06-05-2021		TLM2	
15.	Keys constraints, Domain constraints	1	07-05-2021		TLM2	
16.	Relational algebra	1	08-05-2021		TLM2	
17.	Characteristics of SQL, Advantage of SQL	1	12-05-2021		TLM2	
18.	SQL data types and literals, Types of SQL commands	1	13-05-2021		TLM2	
19.	SQL operators and their procedure	1	15-05-2021		TLM2	
20.	Tables, views and indexes,	1	19-05-2021		TLM2	
21.	Queries and sub queries, Aggregate functions	1	20-05-2021		TLM2	
22.	Insert, update and delete operations	1	21-05-2021		TLM2	
23.	Unions, Intersection, Minus, Cursors in SQL	1	22-05-2021		TLM2	
24.	Unit Overview and Discussion	1	02-06-2021		TLM2	
25.	Assignment - 2	1	03-06-2021		TLM2	
No. of classes required to complete UNIT-II		12				

### 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	
26.	Functional Dependencies, First Normal Form	1	04-06-2021		TLM2		
27.	Second, Third Normal Forms	1	05-06-2021		TLM2		
28.	BCNF, Inclusion Dependences	1	09-06-2021		TLM2		
29.	Loss Less Join Decompositions	1	10-06-2021		TLM2		
30.	Normalization Using FD, MVD, JD	1	11-06-2021		TLM2		
31.	Alternative Approaches To Database Design	1	12-06-2021		TLM2		
32.	Unit Overview and Discussion	1	16-06-2021		TLM2		
33.	Assignment - 3	1	17-06-2021		TLM2		
No. of classes required to complete		10					

UNIT-III			
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#### UNIT –IV: Transaction Processing Concepts & Concurrency Control 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
34.	Transaction System	1	18-06-2021		TLM2	
35.	Testing Of Serializability	1	19-06-2021		TLM2	
36.	Serializability Of Schedules	1	23-06-2021		TLM2	
37.	Conflict & View Serializable Schedule	1	24-06-2021		TLM2	
38.	Recoverability, Log Based Recovery, Checkpoints,	1	25-06-2021		TLM2	
39.	ARIES Algorithm, Deadlock Handling	1	26-06-2021		TLM2	
40.	Concurrency Control	1	30-06-2021		TLM2	
41.	Techniques For Concurrency Control	1	01-07-2021		TLM2	
42.	Time Stamping Protocols For Concurrency Control	1	02-07-2021		TLM2	
43.	Locking, Validation Based Protocol	1	03-07-2021		TLM2	
44.	Multiple Granularity	1	07-07-2021		TLM2	
45.	Recovery With Concurrent Transactions	1	08-07-2021		TLM2	
46.	Unit Overview and Discussion	1	09-07-2021		TLM2	
47.	Assignment - 4	1	10-07-2021		TLM2	
No. of classes required to complete UNIT-IV		14				

#### UNIT-V: Storage and Indexing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48.	RAID Levels	1	14-07-2021		TLM2	
49.	Page, Record Formats	1	15-07-2021		TLM2	
50.	File Types and Organization, Tutorial – IX	1	16-07-2021		TLM3	
51.	ISAM	1	17-07-2021		TLM2	
52.	B-Tree	1	21-07-2021		TLM2	
53.	B+-Tree	1	22-07-2021		TLM2	
54.	RAID Levels	1	23-07-2021		TLM2	
55.	Unit Overview and Discussion	1	24-07-2021		TLM2	
56.	Assignment - 4	1	24-07-2021		TLM2	
No. of classes required to complete UNIT-V		09			No. of classes taken:	

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 (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks = 75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

### PART-D

#### PROGRAMME OUTCOMES (POs):

<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
<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.
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**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

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

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HOD</b>
<b>Mr. V.SIVA KRISHNA</b>	<b>Dr. CH. V. Narayana</b>	<b>DR. D. JAGAN MOHAN REDDY</b>	<b>DR. D. VEERIAH</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.

<http://cse.lbrce.ac.in>, [cse.lbreddy@gmail.com](mailto:cse.lbreddy@gmail.com), Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

<b>PROGRAM</b>	: B.Tech. IV-Sem., CSE
<b>ACADEMIC YEAR</b>	: 2020-21
<b>COURSE NAME &amp; CODE</b>	: SOFTWARE ENGINEERING & 17CI10
<b>L-T-P STRUCTURE</b>	: 3-0-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: B. USHA RANI
<b>COURSE COORDINATOR</b>	: Dr. P. ASHOK REDDY

1. **Pre-requisites:** Concepts of programming and Database Management Systems.

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

An understanding of different software processes and how to choose between them. How to understand requirements from a client and specify them. Design in the large, including principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns. Knowing various quality assurance techniques, including unit testing, integration testing and functional testing.

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

**S381.1: Understand the fundamentals of software engineering concepts and software process standards**

**S381.2: Demonstrate appropriate process models and software engineering practices**

**S381.3: Analyze requirements of software system and explore all requirements gathering approaches**

**S381.4: Create an architectural design using standard design processes**

**S381.5: Apply software testing strategies and tactics for testing real time projects effective**



#### 4. Course Articulation Matrix:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
S381.1	1	3	1	-	-	1	-	-	-	-	1	1	-	-	3
S381.2	1	3	2	-	-	1	-	1	-	-	-	-	-	-	3
S381.3	1	3	2	-	1	1	1	1	1	1	-	-	-	1	3
S381.4	2	3	3	-	1	1	1	1	-	-	-	1	-	-	3
S381.5	1	3	3	-	1	1	-	1	-	-	1	1	2	-	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 BOOK:

- Roger S. Pressman, Software Engineering – A Practitioner’s Approach, Mc. Graw-Hill International Edition, 6<sup>th</sup> Edition, 2005.

#### REFERENCES:

1. Ian Sommerville, “Software Engineering”, Pearson Education, 8<sup>th</sup> Edition, 2008.
2. Ali Behforooz and Frederick J. Hudson, “Software Engineering Fundamentals”, Oxford University Press, New Delhi, 1996.
3. Stephan Schach, “Software Engineering”, Tata Mc. Graw-Hill, 2007.
4. Pfleeger and Lawrence, “Software Engineering: Theory and Practice”, Pearson Education, Second Edition, 2001, 1995, PHI.

#### Web link:

[http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman\\_\\_Software\\_Engineering.pdf](http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman__Software_Engineering.pdf)

## COURSE DELIVERY PLAN (LESSON PLAN): Section-A

### UNIT –I:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Software Engineering & Evolving role of Software	1	16/04/2021	16/04/2021	TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	1	17/04/2021	17/04/2021	TLM2	CO1	T1	
3.	Legacy Software and Its Quality	1	20/04/2021	20/04/2021	TLM2	CO1	T1	
4.	Software Myths	1	23/04/2021	23/04/2021	TLM2	CO1	T1	
5.	Software Process: Definition and Differences & Software Engineering – A layered technology	1	24/04/2021	24/04/2021	TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	27/04/2021	27/04/2021	TLM2	CO1	T1,R1	
7.	CMMI Model	1	30/04/2021	30/04/2021	TLM2	CO1	T1,R1	
8.	Process Patterns & Process Assessment and Approaches	1	01/05/2021	01/05/2021	TLM2	CO1	T1,R1	
9.	Software Process Models, Process Technology & Product and Process	1	04/05/2021	04/05/2021	TLM2	CO1	T1	
10.	<b>ASSIGNMENT-1</b>	1			TLM3	CO1	T1	
No. of classes required to complete UNIT-I		<b>10</b>			No. of classes taken:			

**UNIT –II:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
11.	Process Models: Prescriptive Models & Waterfall Model	1	07/05/2021	07/05/2021	TLM2	CO2	T1	
12.	Incremental Model & RAD Model	1	08/05/2021	08/05/2021	TLM2	CO2	T1	
13.	Evolutionary Process Models	1	11/05/2021	11/05/2021	TLM2	CO2	T1	
14.	Specialized Process Models & Unified Process	1	15/05/2021	15/05/2021	TLM2	CO2	T1	
15.	Software Engineering Practices: Communication Practices	1	18/05/2021	18/05/2021	TLM2		T1	
16.	Planning Practices, Modeling Practice & Construction Practice & Deployment	1	21/05/2021	21/05/2021	TLM2	CO2	T1,R1	
17.	<b>ASSIGNMENT-2</b>	1			TLM3	CO2	T1	
No. of classes required to complete <b>UNIT-2</b>		<b>7</b>			No. of classes taken:			

**UNIT –III:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Requirements Engineering: Description, RE Tasks	1	22/05/2021	22/05/2021	TLM2	CO3	T1	
19.	Initiating the RE Process	1	01/06/2021	01/06/2021	TLM2	CO3	T1	
20.	Eliciting Requirements , Developing Use-Cases	1	04/06/2021	04/06/2021	TLM2	CO3	T1	
21.	Building the Analysis Models	1	05/06/2021	05/06/2021	TLM2	CO3	T1,R1	
22.	Negotiating and Validating Requirements	1	08/06/2021	08/06/2021	TLM2	CO3	T1,R1	
23.	Building the Analysis Model: Requirements Analysis	1	11/06/2021	11/06/2021	TLM2		T1,R1	
24.	Analysis Modeling Approaches & Data Modeling Concepts	1	12/06/2021	12/06/2021	TLM2	CO3	T1	
25.	Object Oriented Analysis,	1	15/06/2021	15/06/2021	TLM2	CO3	T1	

	Scenario Based Modeling							
26.	Flow Oriented Modeling, Class Based Modeling, Creating a Behavioral Model	1	18/06/2021	18/06/2021	<b>TLM2</b>	CO3	T1	
27.	<b>ASSIGNMENT-3</b>	1			<b>TLM3</b>	CO3	T1	
No. of classes required to complete <b>UNIT-3</b>		<b>10</b>			No. of classes taken:			

**UNIT -IV:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Design Engineering: Design within context of Software Engineering	1	19/06/2021	19/06/2021	<b>TLM2</b>	CO4	T1	
29.	Design Process and Design Quality	1	22/06/2021	22/06/2021	<b>TLM2</b>	CO4	T1	
30.	Design Concepts	1	25/06/2021	25/06/2021	<b>TLM2</b>	CO4	T1	
31.	Design Model	1	26/06/2021	26/06/2021	<b>TLM2</b>	CO4	T1,R1	
32.	Pattern Based Software Design	1	29/06/2021	29/06/2021	<b>TLM2</b>	CO4	T1,R1	
33.	Software Architecture and Data Design	1	02/06/2021	02/06/2021	<b>TLM2</b>	CO4	T1	
34.	Architectural Styles and Patterns, Architectural Design	1	03/07/2021	03/07/2021	<b>TLM2</b>	CO4	T1	
35.	<b>ASSIGNMENT-4</b>	1			<b>TLM3</b>	CO4	T1,R1	
No. of classes required to complete <b>UNIT-4</b>		<b>8</b>			No. of classes taken:			

**UNIT-V:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
36.	A Strategic Approach to Software Testing & Strategic Issues	1	06/07/2021	06/07/2021	<b>TLM2</b>	CO5	T1	
37.	Test Strategies for Conventional Software	1	09/07/2021	09/07/2021	<b>TLM2</b>	CO5	T1	
38.	Test Strategies for Object Oriented Software	1	10/07/2021	10/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
39.	Validation Testing & System Testing, The art of Debugging	1	13/07/2021	13/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
40.	Software Testing Fundamentals	1	16/07/2021	16/07/2021	<b>TLM2</b>	CO5	T1	
41.	White Box Testing & Basis Path Testing	1	17/07/2021	17/07/2021	<b>TLM2</b>	CO5	T1	
42.	Control Structure and Black Box Testing	1	20/07/2021	20/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
43.	OO- Testing Methods	1	23/07/2021	23/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
44.	<b>ASSIGNMENT-5</b>				<b>TLM3</b>	CO5	T1,R1,R2	
No. of classes required to complete <b>UNIT-5</b>		<b>8</b>			No. of classes taken:			

<b>Teaching Learning Methods5</b>					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

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

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

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

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

## **PROGRAMME OUTCOMES (POs):**

### **Engineering Graduates will be able to:**

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

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

## **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

### **1. Programming Paradigms:**

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

### **2. Data Engineering:**

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

### **3. Software Engineering:**

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

Course Instructor

Course Coordinator

Module Coordinator

HOD





**BOS APPROVED TEXT BOOKS:**

<b>T1</b>	Sumitabha Das., “Your Unix The Ultimate Guide”, TMH Publications, 2001.
<b>T2</b>	M.G. Venkatesh Murthy, “Introduction to UNIX & SHELL programming”, Pearson Education, First Edition, New Delhi, 2009.

**BOS APPROVED REFERENCE BOOKS:**

<b>R1</b>	B.A. Forouzan & R.F. Giberg, “Unix and shell Programming”, Thomson, First Edition, New Delhi, 2003.
<b>R2</b>	E. Foster – Johnson & others, “Beginning shell scripting”, John Wiley & sons, First Edition, New Delhi, 2008.
<b>R3</b>	Sumitabha Das, “Unix concepts and applications”, TMH Publications, 4 <sup>th</sup> Edition,.
<b>R4</b>	Gaham Glass & K. Ables, Unix for programmers and users, pearson education, 3 <sup>rd</sup> edition,.

<b>Unit</b>	<b>Content</b>	<b>Text Book</b>
<b>I</b>	<b>Introduction to LINUX:</b> Operating System concepts, Introduction to LINUX, Features of LINUX, LINUX Kernel, Terminal and shell.	
	<b>Introduction to LINUX File System:</b> The LINUX file System, File System Hierarchy, File system and inodes, File Attributes, File Permissions.	
	<b>LINUX Commands:</b> man, echo, script, pwd, passwd, who, uname, date, sty, telnet, rlogin, ftp, more, printf, PATH, SU, ps, arp, mkdir, cd, rmdir, ls, cp, rm, mv, cat, wc, lp, od, ln, df, du, locate, tar, zip, chmod, unmask, mount, unmount, ulimit.	
<b>II</b>	<b>Introduction to Shell:</b> Shell responsibilities, running a shell script, Pipes, Redirection, Command Substitution.	
	<b>Shell Programming:</b> VI Editor, the shell as a programming Language, Shell Meta Characters, Shell Variables, Shell Commands, Control Structures, Shell Script Examples.	
<b>III</b>	<b>Filters: simple filters and commands:</b> pr, cmp, comm, unlink, diff, head, tail, find, cut, paste, sort, uniq, tr, w, finger.	
	<b>Regular Expressions:</b> grep, egrep, fgrep, Sed- line addressing, context addressing, text editing, substitution.	
	<b>Programming with awk:</b> awk statements, variables and expressions, comparison and logical operators, Begin and End sections, decision and looping statements.	
<b>IV</b>	<b>The Process:</b> Process concept, Process Creation Mechanism, process attributes.	
	<b>LINUX Internal:</b> LINUX Kernel Structure, System Calls, Signals, Memory Management.	
	<b>Network Implementation:</b> TCP Sockets- socket, connect, listen, read, write, accept, fork, UDP sockets, sendto, recvfrom functions.	
<b>V</b>	<b>Multi-Processing:</b> The Intel multi-processor specification, problems with multi-processor systems, changes to the kernel, compiling LINUX SMP.	

**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction to Linux**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Operating systems	01	12/04		TLM1	CO1	T1	
2.	Features of Linux kernel and shell	01	13/04		TLM1	CO1	T1	
3.	Linux file systems	01	16/04		TLM1, TLM2	CO1	T1	
4.	Linux Commands	01	17/04		TLM1, TLM2	CO1	T1	
5.	Linux Commands	01	19/04		TLM1, TLM2	CO1	T1	
6.	Linux Commands	01	20/04		TLM1, TLM2	CO1	T1	
7.	Linux Commands	01	23/04		TLM1, TLM2	CO1	T1	
8.	Linux Commands	01	24/04		TLM1, TLM2	CO1	T1	
9.	Examples	01	26/04		TLM1, TLM2	CO1	T1	
10.	Examples	01	27/04		TLM1, TLM2	CO1	T1	
No. of classes required to complete UNIT-I		10	No. of classes taken:					

**UNIT- II: Introduction to Shell and Shell programming**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Shell	01	30/04		TLM1	CO2	T1	
2.	Shell responsibilities	01	03/05		TLM1	CO2	T1	
3.	Pipes, Redirection, Command Substitution	01	04/05		TLM1	CO2	T1	
4.	Shell programming (VI editor)	01	07/05		TLM1, TLM2	CO2	T1	
5.	Shell programming (VI editor)	01	08/05		TLM1, TLM2	CO2	T1	
6.	Shell Meta Characters	01	10/05		TLM1, TLM2	CO2	T1	
7.	Shell Variables, Shell Commands	01	14/05		TLM1, TLM2	CO2	T1	
8.	Control Structures, Shell Script Examples	01	15/05		TLM1, TLM2	CO2	T1	
9.	Shell Script Examples	01	17/05		TLM1, TLM2	CO2	T1	
10.	Shell Script Examples	01	18/05		TLM1, TLM2	CO2	T1	
11.	Shell Script Examples	01	21/05		TLM1, TLM2	CO2	T1	
12.	Shell Script Examples	01	22/05		TLM1, TLM2	CO2	T1	
No. of classes required to complete UNIT-II		12	No. of classes taken:					

### UNIT- III: Filters, regular expressions and Programming with AWK

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Filters and commands	01	31/05		TLM1, TLM2	CO3	T1	
2.	Filters and their usage	01	01/06		TLM1, TLM2	CO3	T1	
3.	Filters and their usage	01	02/06		TLM1, TLM2	CO3	T1	
4.	grep, egrep and fgrep	01	07/06		TLM1, TLM2	CO3	T1	
5.	sed command	01	08/06		TLM1, TLM2	CO3	T1	
6.	sed command examples	01	11/06		TLM1, TLM2	CO3	T1	
7.	awk statements, variables and expressions, comparison and logical operators,	01	12/06		TLM1, TLM2	CO3	T1	
8.	Begin and End sections, decision and looping statements	01	14/06		TLM1, TLM2	CO3	T1	
9.	AWK examples	01	15/06		TLM1, TLM2	CO3	T1	
10.	AWK examples	01	18/06		TLM1, TLM2	CO3	T1	
11.	AWK examples	01	19/06					
12.	AWK examples	01	21/06					
No. of classes required to complete UNIT-III		12	No. of classes taken:					

### UNIT- IV: Linux internals and networking

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.	Linux process and process attributes	01	22/06		TLM1	CO4	T1	
2.	Linux kernel and system calls	01	25/06		TLM1, TLM2	CO4	T1	
3.	System callas and signals	01	26/06		TLM1, TLM2	CO4	T1	
4.	Linux Memory Management	01	28/06		TLM1, TLM2	CO4	T1	
5.	Linux networking	01	29/06		TLM1, TLM2	CO4	T1	
6.	Network Transport protocols	01	02/07		TLM1, TLM2	CO4	T1	
7.	TCP Sockets- socket, connect, listen	01	03/07		TLM1, TLM2	CO4	T1	
8.	read, write, accept, fork	01	05/07		TLM1, TLM2	CO4	T1	
9.	UDP sockets, sendto, recvfrom functions	01	06/07		TLM1, TLM2	CO4	T1	
10.	Networking examples using C	01	09/07		TLM1, TLM2	CO4	T1	
No. of classes required to complete UNIT-IV		10	No. of classes taken:					

## UNIT- V: Multi-Processing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to multi-processing	01	10/07		TLM1	CO5	T1	
2.	Introduction to multi-processing	01	12/07		TLM1, TLM2	CO5	T1	
3.	Problems with multi-processor systems	01	13/07		TLM1, TLM2	CO5	T1	
4.	Problems with multi-processor systems	01	16/07		TLM1, TLM2	CO5	T1	
5.	Changes to the kernel	01	17/07		TLM1, TLM2	CO5	T1	
6.	Changes to the kernel	01	19/07		TLM1, TLM2	CO5	T1	
7.	compiling LINUX SMP	01	20/07		TLM1, TLM2	CO5	T1	
8.	compiling LINUX SMP	01	23/07		TLM1, TLM2	CO5	T1	
No. of classes required to complete UNIT-V		08	No. of classes taken:					

**NOTE: The rest of the class work can be tough through practical oriented.**

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

### ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	12/04/2021	22/05/2021	6 W
I Mid Examinations	24/05/2021	29/05/2021	1 W
II Phase of Instructions	31/05/2021	24/07/2021	8 W
II Mid Examinations	26/07/2021	31/07/2021	1 W
Practical	02/08/2021	07/08/2021	1 W
Semester End Examinations	09/08/2021	21/08/2021	2 W

Course Instructor

Course Coordinator

Module Coordinator

HOD



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr T.Chandrasekhar Yadav  
Course Name & Code : Professional Ethics & Human Values  
L-T-P Structure : 3-0-0 Credits : 0  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- A A.Y : 2020-21

**PRE-REQUISITE: ETHICS & VALUES**

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**

- ❖ To create an awareness on engineering ethics and human values.
- ❖ To give an impetus on achieving higher positions in profession, with ethical and human values as a base and support for the growth.
- ❖ To make the student realize the sensitiveness associated with experimentation process
- ❖ To adumbrate the inevitability of different intellectual property rights like patents, copyrights, trademarks, and trade secret.
- ❖ To explicate the professional and societal responsibilities of the engineers.

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

CO 1	Implement the basic concepts of Professional Ethics in real time decision making process
CO 2	Absorbs the basic concepts of Human values to gain the connotations of ethical theories
CO 3	Recognizes the duties and responsibilities towards the society in an engineering profession
CO 4	Undertakes necessary precautions while conducting the experiments which may reduce the risk
CO 5	Realizes the importance of ethical aspects in globalization

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

CO's / PO's	R17-Professional Ethics & Human Values-S355											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1								3				
CO2			1					3				
CO3		1	2					3	2			
CO4				1		2		3	1			
CO5						1	2	3				1
3 = High (100%)                                  2= Moderate (70%)                                  1= Slight (Low) (40%)												

**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** R.S.Nagarajan, a Textbook on “Professional Ethics and Human Values”, New Age Publishers – 2006.

**T2** Mike Martin and Roland Schinzinger, "Ethics in engineering", McGraw Hill, New York 1996.

**BOS APPROVED REFERENCE BOOKS:**

**R1** Govindarajan M, Natarajan S, Senthil Kumar V. S, “ Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.

**R2** Charles D. Fleddermann, "Engineering Ethics", Pearson Education/ Prentice Hall, New Jersey,2004 ( Indian Reprint now available )

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Engineering Ethics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and COs	1	12-04-21		TLM1/2	
2.	Introduction to Unit-I	1	16-04-21		TLM1/2	
3.	UNIT-I Introduction about engineering ethics	1	17-04-21		TLM1/2	
4.	Senses of engineering ethics, Variety of moral issues	1	19-04-21		TLM1/2	
5.	Moral dilemmas moral autonomy	1	23-04-21		TLM1/2	
6.	Kohlberg's theory	1	24-04-21		TLM1/2	
7.	Gilligan theory, Consensus and controversy	1	26-04-21		TLM1/2	
8.	Models of professional roles about right action, self interest	1	30-04-21		TLM1/2	
9.	Customs and religion, uses of ethical theories	1	01-05-21		TLM1/2	
10.	Uses of ethical theories	1	03-05-21		TLM1/2	
11.	Assignment-1				TLM3	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

#### UNIT-II: Human Values

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 about values	1	07-05-21		TLM1/2	
2.	Morals ethics and values, Integrity	1	08-05-21		TLM1/2	
3.	Work ethic, Service learning, Civic virtue	1	10-05-21		TLM1/2	
4.	Respect for others, living peacefully, Caring, sharing,	1	15-05-21		TLM1/2	
5.	Honesty, courage, Valuing time, cooperation	1	17-05-21		TLM1/2	
6.	Commitment, Empathy, self confidence	1	21-05-21		TLM1/2	
7.	Character, spirituality	1	22-05-21		TLM1/2	
8.	Assignment-2				TLM3	
No. of classes required to complete UNIT-II: 7				No. of classes taken:		
IST MID EXAMS : 24-05-21 to 29-05-21						

**UNIT-III: Engineering as Social Experimentation**

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.	Engineering as experimentation introduction	1	31-05-21		TLM1/2	
2.	Engineering Projects VS. Standard Experiments	1	04-06-21		TLM1/2	
3.	Engineers as responsible experimenters	1	05-06-21		TLM1/2	
4.	Codes of ethics, Industrial Standards	1	07-06-21		TLM1/2	
5.	A balanced outlook on law	1	11-06-21		TLM1/2	
6.	The challenger case study	1	12-06-21		TLM2	
7.	Assignment-3				TLM3	
No. of classes required to complete UNIT-III: 6				No. of classes taken:		

**UNIT-IV: Safety, Responsibilities and Rights**

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 about Safety, and rights	1	14-06-21		TLM1/2	
2.	Assessment of safety and risk	1	18-06-21		TLM1/2	
3.	Risk benefit analysis and reducing risk ,Three Mile Island and Chernobyl case study	1	19-06-21		TLM1/2	
4.	Collegiality and loyalty, Respect for authority,	1	21-06-21		TLM1/2	
5.	Collective bargaining-Confidentiality	1	25-06-21		TLM1/2	
6.	Conflicts of interest, Occupational crime	1	26-06-21		TLM1/2	
7.	Professional Rights, Employee rights	1	28-06-21		TLM1/2	
8.	Intellectual Property Rights (IPR)	1	02-07-21		TLM1/2	
9.	Assignment-4				TLM3	
No. of classes required to complete UNIT-IV: 8				No. of classes taken:		

**UNIT-V: Global Issues**

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.	MNC's, Morality in MNC's	1	03-07-21		TLM1/2	
2.	Environmental Ethics	1	05-07-21		TLM1/2	
3.	Computer ethics.	1	09-07-21		TLM1/2	
4.	Weapons development	1	10-07-21		TLM1/2	
5.	Engineers as managers, consulting engineers	1	12-07-21		TLM1/2	



6.	Engineers as expert witnesses	1	16-07-21		TLM1/2
7.	Engineers as Advisors & Policy Makers	1	17-07-21		TLM1/2
8.	Moral leadership	2	19-07-21&23-07-21		TLM1/2
	Assignment-5				TLM-3
9.	Sample code of Ethics	1	24-07-21		TLM1/2
No. of classes required to complete UNIT-V:10				No. of classes taken:	

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/ Assignment	<b>TLM6</b>	Group Discussion/Project

### **PART-C**

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

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

<b>PSO 1</b>	<b>Programming paradigms:</b> To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement data driven applications into the students.
<b>PSO 3</b>	<b>Software Engineering:</b> Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products

Course Instructor  
(Dr T.Chandrasekhar  
Yadav)

Course Coordinator  
(Dr T.Chandrasekhar Yadav)

Module Coordinator  
(Dr.V.V.Narsi Reddy)

HOD  
(Dr.A.Adishesha  
Reddy)



# 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.

<http://cse.lbrce.ac.in>, [cse.lbreddy@gmail.com](mailto:cse.lbreddy@gmail.com), Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

Name of Course Instructor : Mr. V. SIVA KRISHNA  
Course Name & Code : Database Management Systems Lab-17CI64  
L-T-P Structure : 0-0-2 Credits : 1  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- A A.Y : 2020-21

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

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

CO1	Design & implement a database schema for a given problem-domain.
CO2	Create database using SQL and implement various integrity constraints.
CO3	Apply PL/SQL Programming for problem solving.
CO4	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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

## **Part-B**

### **CYCLE-1**

1) **Create a table STUDENT with appropriate data types and perform the following queries.**

**Roll number, student name, date of birth, branch and year of study.**

1. Insert 5 to 10 rows in a table?
2. List all the students of all branches
3. List student names whose name starts with 's'
4. List student names whose name contains 's' as third literal
5. List student names whose contains two 's' anywhere in the name
6. List students whose branch is NULL
7. List students of CSE & ECE who born after 1980
8. List all students in reverse order of their names
9. Delete students of any branch whose name starts with 's'
10. Update the branch of CSE students to ECE
11. Display student name padded with '\*' after the name of all the students

2) **Create the following tables based on the above Schema Diagram with appropriate data types and constraints and perform the following queries.**

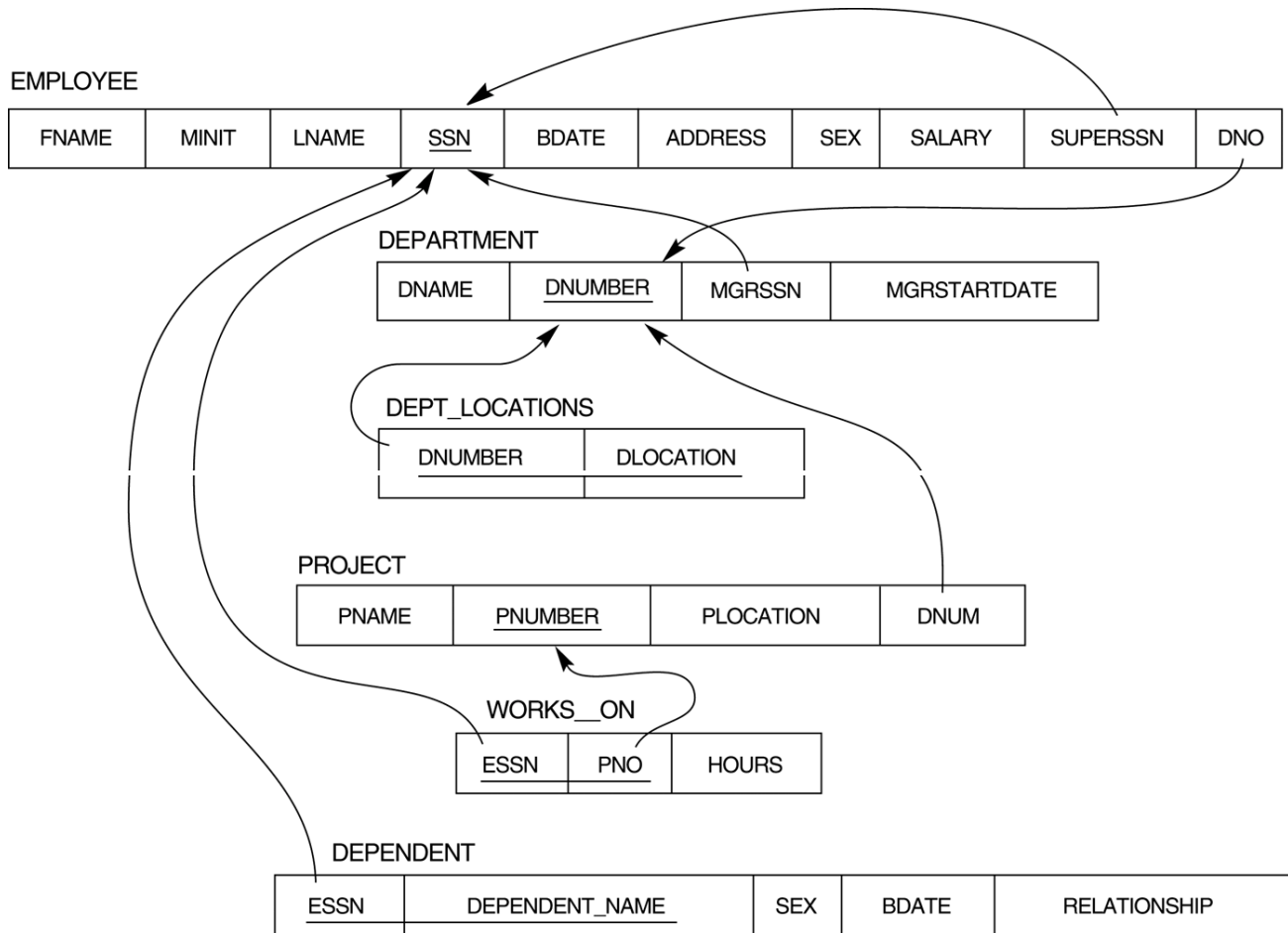
**SAILORS** (Sailid, Salname, Rating, Age)

**RESERVES** (Sailid, boatid, Day)

**BOATS** (Boatid, Boat-name, Color)

1. Insert 5 to 10 rows in all tables?
2. Find the name of sailors who reserved boat number 3.
3. Find the name of sailors who reserved green boat.
4. Find the colors of boats reserved by "Ramesh".
5. Find the names of sailors who have reserved atleast one boat.
6. Find the all sailid of sailors who have a rating of 10 or have reserved boated 104.
7. Find the Sailid's of sailors with age over 20 who have not registered a red boat.
8. Find the names of sailors who have reserved a red or green boat.
9. Find sailors whose rating is better than some sailor called 'Salvador'.
10. Find the names of sailors who are older than the oldest sailor with a rating of 10.

3) Schema Diagram for the rest of the SQL and PLSQL Programs.



Create the following tables based on the above Schema Diagram with appropriate data types and constraints.

**EMPLOYEE (Fname, Mname, Lname, SSN, Bdate, Address, Gender, Salary, SuperSSN, Dno)**

**DEPARTMENT(Dnumber, Dname, MgrSSN, Mgrstartdate)**

**DEPENDENT (ESSN, Dependent\_Name, Gender, Bdate, Relationship)**

- 1) Insert 5 to 10 rows into all the tables.
- 2) Display all employee's names along with their department names.
- 3) Display all employee's names along with their dependent details.
- 4) Display name and address of all employees who work for 'ECE' department.
- 5) List the names of all employees with two or more dependents.
- 6) List the names of employee who have no dependents.
- 7) List the names of employees who have at least one dependent.
- 8) List the names of the employees along with names of their supervisors using aliases.
- 9) Display name of the department and name of manager for all the departments.
- 10) Display the name of each employee who has a dependent with the same first name

and gender as the employee.

- 11) List the names of managers who have at least one dependent.
- 12) Display the sum of all employees' salaries as well as maximum, minimum and average salary in the entire departments department wise if the department has more than two employees.
- 13) List the departments of each female employee along with her name.
- 14) List all employee names and also the name of the department they manage if they happen to manage a dept.
- 15) Display the name of the employee and his / her supervisor's name.

**4) Create the following tables based on the above Schema Diagram with appropriate data types and constraints in addition to the tables in Experiment 2.**

**DEPT\_LOCATIONS (Dnumber, Dlocation)**

**PROJECT (Pname, Pnumber, Plocation, Dnum)**

**WORKS\_ON(ESSN, Pno, Hours).**

- 1) Insert 5 to 10 rows into all the tables.
- 2) Find the names of the employees who work on all the projects controlled by the department 'ECM'.
- 3) List the project number, name and no. Of employees who work on that project for all the projects.
- 4) List the names of all the projects controlled by the departments department wise.
- 5) Retrieve the names of employees who work on all projects that 'John' works on.
- 6) List the project numbers for projects that involve an employee either as worker or as a manager of the department that controls the project.
- 7) List the names of all employees in one department who work more than 10 hours on one specific project.
- 8) For each project, list the project name and total hours (by all employees) spent on that project.
- 9) Retrieve the names of all employees who work on every project.
- 10) Retrieve the names of all employees who do not work on any project.
- 11) Display the name and total no. of hours worked by an employee who is working on maximum no. of projects among all the employees.
- 12) Display the names of all employees and also no. of hours, project names that they work on if they happen to work on any project(use outer join).
- 13) List the employee name, project name on which they work and the department they belong to for all the employees using alias names for the resulting columns.
- 14) Retrieve the names of all employees who work on more than one project department wise.

15) List all the departments that contain at least one occurrence of 'C' in their names.

**5) Create a view that has project name, controlling department name, number of employees and total hours worked on the project for each project with more than one employee working on it.**

1) List the projects that are controlled by one department from this view.

2) List the managers of the controlling departments for all the projects.

3) Demonstrate one update operation on this view.

4) List the Location of the controlling departments for all the projects.

5) Retrieve the data from the view.

### **PL/SQL LAB CYCLE**

#### **CYCLE-II**

6. Write a PL/SQL Block to find whether the number is Armstrong or not.

7. Write a PL/SQL program for generating Fibonacci series

8. Write an anonymous PL/SQL block that fetches and displays the data from employee table to the console.

9. Write a program that updates salaries of all employees with 10 % hike (use cursors).

10. Write a program to fetch salary and employee name from employee table for a given user input.

When no data found raise an exception that prints the message "no data found".

11. Write a program to find the number of records of any given table using % ROWCOUNT.

12. Write a cursor to display the list of employees and total salary department wise.

13. Write a database trigger on employee table so that the trigger fires when all the DML statements are executed (print appropriate message).

14. Write a trigger in such a way that it should not allow insert or update or delete on Wednesday and Thursday and display the proper message.

15. Write a procedure to display the name and salary of employee when user inputs SSN using IN/OUT parameters.

16. Write a function to check the validity of the given employee number from the employee table (print the appropriate message using PL/SQL block).

17. Visit TPC and submit report.

## 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	Learning Outcome COs	HOD Sign Weekly
1	Introduction to DBMS	2	16-04-2021		TLM8	CO1	
2	<b>CYCLE-I : EXP-1</b>	2	23-04-2021		TLM8	CO1,CO4	
3	EXP-2	2	30-05-2021		TLM8	CO1,CO4	
4	EXP-3	2	06-05-2021		TLM8	CO1,CO4	
5	EXP-4	2	13-05-2021		TLM8	CO1,CO4	
6	EXP-5	2	20-05-2021		TLM8	CO1,CO4	
7	<b>CYCLE-II : EXP-6, EXP7</b>	2	27-05-2021		TLM8	CO1,CO4	
8	EXP-8, EXP9	2	03-06-2021		TLM8	CO2,CO4	
9	EXP-10, EXP11	2	10-06-2021		TLM8	CO2,CO4	
10	EXP-12	2	17-06--2021		TLM8	CO2,CO4	
11	EXP-13	2	24-06-2021		TLM8	CO2,CO4	
12	EXP-14	2	01-07-2021		TLM8	CO3,CO4	
13	EXP-15	2	08-07-2021		TLM8	CO3,CO4	
14	EXP-16, EXP17	2	15-07-2021		TLM8	CO3,CO4	
15	Internal Exam	2	22-07-2021				

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

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mr. V. SIVA KRISHNA	Mr. M. SITHA RAM	DR. D. JAGAN MOHAN REDDY	DR. D. VEERAI AH





# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : Dr,D.Jagan Mohan Reddy  
**Course Name & Code** : Linux Programming Lab & 17CI61  
**L-T-P Structure** : 2-0-0 Credits : 2  
**Program/Sem/Sec** : B.Tech., CSE., IV-Sem., Sections- A A.Y : 2020-21  
**PRE-REQUISITE** : Knowledge in Operating Systems

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** Introduce the student to Linux kernel programming techniques. Review basic concepts covered in the core Operating Systems course prerequisite as they are realized in the Linux platform. Discuss the Process, Inter-Process Communication Techniques and Network Implementation in Linux.

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

CO 1	Explore LINUX Ecosystem.
CO 2	Implement Shell scripting in LINUX Kernel.
CO 3	Design AWK scripts for text processing and Apply Regular Expressions for Pattern Matching.
CO 4	Design Scripts for Process Creation & Network 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	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).

#### **TEXT BOOKS:**

**T1** Sumitabha Das., “Your Unix The Ultimate Guide”, TMH Publications, 2001.

**T2** M.G. Venkatesh Murthy, “Introduction to UNIX & SHELL programming”, Pearson Education, First Edition, New Delhi, 2009.

**REFERENCE BOOKS:**

- R1** B.A. Forouzan & R.F. Giberg, “Unix and shell Programming”, Thomson, First Edition, New Delhi, 2003.
- R2** E. Foster – Johnson & others, “Beginning shell scripting”, John Wiley & sons, First Edition, New Delhi, 2008.
- R3** Sumitabha Das, “Unix concepts and applications”, TMH Publications, 4<sup>th</sup> Edition,.
- R4** Gaham Glass & K. Ables, Unix for programmers and users, pearson education, 3<sup>rd</sup> edition,.

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

S.No.	Experiments to be covered	No. of sessions Required (1 session 2 hrs)	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	<b>Week1</b> <b>Session-1</b> a)Log into the system b) Use vi editor to create a file called myfile.txt which contains some text. c) Correct typing errors during creation. d)Save the file e)logout of the system <b>Session-2</b> a)Log into the system b)open the file created in session 1 c)Add some text d)Change some text e)Delete some text f)Save the Changes g)Logout of the system	1	12-4-21		<b>TLM4</b>	
2.	<b>Week2</b> a. log in the system b Use the appropriate commands to determine your login shell c. use the / etc/ passwd file to Verify the result of step b. d. use the who command redirect the result to a file called myfile.txt. Use the more command to see the contents of myfile.txt. e) Use the date and who commands in sequence? (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile1.txt. Use the	1	19-4-2021		<b>TLM4</b>	
3.	<b>Week3</b> Log into the system Use the cat command to create a file containing the following data. Call it mytable.txt use tabs to separate the fields	1	26-4-21		<b>TLM4</b>	

	<p>1425 ravi 15.65  4320 ramu 26.27  6830 sita 36.15  1450 raju 21.86</p> <p>a. use the cat command to display the file, mytable.txt  b. use the vi command to correct any errors in the file, mytable.txt  c. use the sort command to sort the file mytable.txt according to the first field. Call the sorted file mytable.txt (same name)  d. print the file mytable.txt  e. use the cut &amp; paste commands to swap fields 2 and 3 my table. Call it mytable.txt (same name)  f. print the new file, mytable.txt  g. logout of the system</p>					
4.	<p><b>Week4</b></p> <p>a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.  b)Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.  c) Write a shell script that determines the period for which a specified user is working on the system.</p>	1	3-5-2021		<b>TLM4</b>	
5.	<p><b>Week5</b></p> <p>Write a shell script that computes the total and average marks of a student according to the following</p> <p>If average marks <math>\geq 69</math> then result is “Distinction”  If average marks <math>\geq 59</math> and <math>\leq 70</math> then result is “First Class”  If average marks <math>\geq 49</math> and <math>\leq 60</math> then result is “Second Class”  If average marks <math>\leq 50</math> then result is “Pass”  Note that any subject marks <math>\leq 40</math> then result is “Fail”  Accept student name and six subject marks through the key board</p>	1	10-05-2021		<b>TLM4</b>	
6.	<p><b>Week6</b></p> <p>a) Write an interactive file handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.</p>	1				

	<p>b) Write shell script that takes a login name as command – line argument and reports when that person logs in</p> <p>c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.</p>		17-05-2021		
7.	<p><b>Week7</b></p> <p>a)Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.</p> <p>b)Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.</p>	1	24-05-21		<b>TLM4</b>
8.	<p><b>Week8</b></p> <p>a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.</p> <p>b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.</p>	1	31-05-21		<b>TLM4</b>
9.	<p><b>Week9</b></p> <p>a) Write a shell script to perform the following string operations:</p> <p>i)To extract a sub-string from a given string.</p> <p>ii)To find the length of a given string.</p> <p>b) Write a awk script to find the number of characters, words and lines in a file.</p>	2	7-6-21		<b>TLM4</b>
10.	<p><b>Week10</b></p> <p>Write a C program that takes one or more file or directory names as Command line input and reports the following information on the file:</p> <p>i) File type</p> <p>ii) Number of links</p> <p>iii) Read, write and execute permissions</p> <p>iv) Time of last access</p> <p>(Note : Use stat/fstat system calls)</p>	1	14-6-21		<b>TLM4</b>
11.	<p><b>Week11</b></p> <p>Write C programs that simulate the following unix commands:</p> <p>a) mv</p> <p>b) cp</p> <p>c) ls</p> <p>(Use system calls)</p>	1	21-6-21		<b>TLM4</b>

12.	<b>Week12</b> Write a program for bubble sorting using fork system call in linux	1	28-6-21		<b>TLM4</b>	
13.	<b>INTERNAL LAB EXAM</b>	-				

<b>Teaching Learning Methods</b>			
<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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks = 75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### **PROGRAMME OUTCOMES (POs):**

<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 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>	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
<b>PSO 2</b>	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
<b>PSO 3</b>	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Course Instructor  
(Name)

Course Coordinator  
(Name)

Module Coordinator  
(Name)

HOD  
(Name)





# 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.

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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : DR.Y.VIJAY BHASKAR REDDY

**Course Name & Code** : OOPs through JAVA LAB (17CI65)

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

**Program/Sem/Sec** : B.Tech., CSE, IV-Sem., Section – A A.Y: 2020 - 2021

#### PRE-REQUISITE: C PROGRAMMING

#### COURSE OBJECTIVE:

Concentrates on the methodological and technical aspects of software design and programming based on OOP. Acquire the basic knowledge and skills necessary to implement object oriented programming techniques in software development through java. Know about the importance of GUI based applications and the development of applications through java.

#### COURSE OUTCOMES (COs)

At the end of the course, the student will be able to:

<b>CO1</b>	Implement and Test the concepts of OOP in program design with a few example exercises.
<b>CO2</b>	Implement and Test the performance of Exception handling, Multithreading concepts with a few examples.
<b>CO3</b>	Implement and Test the performance of GUI based applications using AWT, Swings.
<b>CO4</b>	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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

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

**1**- Slight (Low),

**2** – Moderate (Medium),

**3** - Substantial (High).

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Java programming	2	14.04.2021		TLM4	
2.	Introduction to Java Compiler	2	28.04.2021		TLM4	
3.	Programs on Basic control structures & Loops	2	05.05.2021		TLM4	
4.	Programs on Basic control structures & Loops	2	12.05.2021		TLM4	
5.	Programs on recursion	2	19.05.2021		TLM4	
6.	Programs on Arrays	2	26.05.2021		TLM4	
7.	Programs on Constructors & Method Overloading	2	02.06.2021		TLM4	
8.	Programs on String & String Buffer classes	2	09.06.2021		TLM4	
9.	Programs on Inheritance , super and final keyword	2	16.06.2021		TLM4	
10.	Programs on Run-Time Polymorphism, Packages and Interfaces	2	23.06.2021		TLM4	
11.	Programs on Exception Handling & Multithreading	2	30.06.2021		TLM4	
12.	Programs on Applets & Event Handling	2	07.07.2021		TLM4	
13.	Programs on Applets & Event Handling	2	14.07.2021		TLM4	
14.	Programs on AWT Components & Layout Managers, Programs on Swings	2	21.07.2021		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

### 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 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.
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<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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
DR. Y. V. B. REDDY	DR. Y. V. BHASKAR REDDY	DR. D. VEERAAIAH	DR. D. VEERAAIAH



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## COURSE HANDOUT

### PART-A

Name of Course Instructor : G V Suresh  
Course Name & Code : Design and Analysis of Algorithms- 17CI08  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- B A.Y : 2020-21

**PRE-REQUISITE:** : Basic of Programming language and Data structure

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

Students undergoing this course are expected to:

Explain the fundamental concepts of various algorithm design techniques. Make the students familiar to conduct performance evaluation of algorithms. Expertise the students with the various existing algorithm design techniques .Motivate the students to design a new algorithm for various problems and introduce the concepts of P&NP-class problems.

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

CO 1	Identify the basic properties and analysis methods of algorithms and design divide and conquer paradigm for solving a few example problems and analyze them.
CO 2	Design Greedy algorithms for knapsack problem, minimum cost spanning tree,single source shortest path problem and analyze them.
CO 3	Apply dynamic programming paradigm to solve travelling sales person problem,0/1 knapsack problem,Optimal binary search tree.
CO 4	Apply Backtracking search methods on state space trees for few example problems
CO 5	Analyze branch and bound search methods through problems such as 0/1 knapsack problem, Travelling salesperson problem.

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

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

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

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

**TEXTBOOKS:**

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

T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson, 2007.

**REFERENCE BOOKS**

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

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

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to course	1	15.04.2021		TLM1	
2.	Algorithm definition and Specifications	1	20.04.2021		TLM1	
3.	Performance Analysis	1	22.04.2021		TLM1	
4.	Time Complexity and space complexity	1	27.04.2021		TLM1	
5.	Asymptotic Notations- Big-Oh, Omega and Theta	1	28.04.2021		TLM1 /TLM2	
6.	Divide & Conquer Technique: General Method	1	29.04.2021		TLM1 /TLM2	
7.	Binary Search and its analysis	1	04.05.2021		TLM1 /TLM2	
8.	Finding Maximum and Minimum and its Analysis	1	05.05.2021		TLM1 /TLM2	
9.	Merge sort and its Analysis	1	06.05.2021		TLM1 /TLM2	
10.	Quick Sort algorithm and its analysis	1	11.05.2021		TLM1 /TLM2	
11.	Assignment 1/Tutorial-1	1	12.05.2021		TLM 3	
No. of classes required to complete UNIT-I : <b>11</b>				No. of classes taken:		

**UNIT –II: Greedy Method**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
12.	Greedy Method – Introduction, General method	1	13.05.2021		TLM1/ TLM2	
13.	Knapsack problem , Example problem	1	18.05.2021		TLM1 /TLM2	
14.	Job sequencing with deadlines, Example problem	1	19.05.2021		TLM1 /TLM2	
15.	Minimum cost spanning trees, example problem	1	20.05.2021		TLM1 /TLM2	
16.	Optimal storage on tapes, Example problem	1	01.06.2021		TLM1 /TLM2	
17.	Optimal Merge patterns, Example problem	1	02.06.2021		TLM1 /TLM4	
18.	Single source Shortest path problem	1	03.06.2021		TLM1 /TLM2	
19.	Assignment-2/Tutorial-2	1	08.06.2021		TLM 3	
No. of classes required to complete <b>UNIT-2 : 08</b>				No. of classes taken:		

**UNIT –III: DYNAMIC PROGRAMMING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Dynamic Programming- General method	1	09.06.2021		TLM1	
21.	Multistage Graph, Example problem	1	10.06.2021		TLM1 /TLM2	
22.	All pairs Shortest path, Example problem	1	15.06.2021		TLM1 /TLM2	
23.	Optimal Binary Search Tree , Example problem	1	16.06.2021		TLM1 /TLM2	
24.	0/1 Knapsack Problem	1	17.06.2021		TLM1 /TLM2	
25.	Travelling Salesperson Problem	1	22.06.2021		TLM1	
26.	Single source shortest path problem, Example Problem	1	23.06.2021		TLM1	
27.	Reliability design, Example Problem	1	24.06.2021		TLM1	
28.	Tutorial-3/ Assignment-3	1	29.06.2021		TLM 3	
No. of classes required to complete <b>UNIT-3 : 09</b>				No. of classes taken:		

**UNIT –IV: BACK TRACKING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	General Method	1	30.06.2021		TLM1	
30.	The 8-Queens problem	2	01.07.2021		TLM1 /TLM2	
31.	Sum of subsets problem	2	06.07.2021		TLM1 /TLM2	
32.	Graph coloring problem	1	07.07.2021		TLM1 /TLM2	
33.	Hamiltonian cycles	1	08.07.2021		TLM1 /TLM2	
34.	Tutorial-4/Assignment-4	1	13.07.2021		TLM 3	
No. of classes required to complete <b>UNIT-4 : 08</b>						

**UNIT-V: NP- HARD AND NP-COMPLETE 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
35.	Branch and Bound- General method	1	14.07.2021		TLM1	
36.	LC Branch and bound solution for Travelling Sales Person Problem	1	15.07.2021		TLM1 /TLM2	
37.	LC Branch and bound solution 0/1 Knapsack problem	2	20.07.2021		TLM1 /TLM2	
38.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	22.07.2021		TLM1 /TLM2	
39.	FIFO Branch and bound solution 0/1 Knapsack problem	1	22.07.2021		TLM1 /TLM2	
40.	Assignment-5 /Tutorial-5	1	22.07.2021		TLM 3	
No. of classes required to complete <b>UNIT-5 : 08</b>						

<b>Teaching Learning Methods</b>			
<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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100



## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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>	<b>Programming Paradigms:</b> To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to Analyze, Design and implement data driven applications into the students.
<b>PSO 3</b>	<b>Software Engineering:</b> Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Course Instructor  
G.V.Suresh

Course Coordinator  
Mr. G.V.Suresh

Module Coordinator  
Dr. D. Veeraiah

HOD  
Dr. D. Veeraiah



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

## COURSE HANDOUT

### PART-A

Name of Course Instructor : Dr. CH V NARAYANA  
Course Name & Code : Database Management Systems-17CI09  
L-T-P Structure : 4-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- B A.Y : 2020-21

**PRE-REQUISITE:**Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**This course enables the students to know about Basic concepts of DBMS, Database Languages, Database Design, Normalization Process, Transaction Processing, and Indexing.

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

CO1	Outline the components of DBMS & design database using ER model
CO2	Construct database using SQL and extract data from database using Relational algebra & SQL queries.
CO3	Apply the normalization process for effective database design
CO4	Analyze components of transaction processing, Concurrency control mechanisms and recovery strategies of DBMS
CO5	Evaluate different File organization & Indexing Techniques

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

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

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

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

**TEXT BOOKS:**

- T1** Henry F. Korth, Abraham Silberschatz, S.Sudarshan, “Database System Concepts”, McGraw Hill, 6 th edition, 2009.
- T2** RamezElmasri, ShamkanthB.Navathe, “Fundamentals of Database Systems”, Addison Wesley, 6 th edition, 2010.

**REFERENCE BOOKS:**

- R1** Raghu Ramakrishnan, JohannesGehrke, “Database Management System”, McGraw Hill, 3 rd edition, 2000.
- R2** Date C J, “An Introduction to Database System”, Pearson Education, 8th edition, 2003
- R3** Sharad Maheshwari, Ruchin Jain, “DBMS: Complete Practical Approach”, Firewall Media, New Delhi, 2005

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****COURSE DELIVERY PLAN (LESSON PLAN): Section-A****UNIT –I: Introduction & Data modeling 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	Lear ning Outc ome COs	Text Book followed	HOD Sign Weekly
1.	Introduction, An overview of database management system	1	12-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
2.	Database system Vs file system	1	15-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
3.	Database system concepts and architecture	1	17-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
4.	Data models schema and instances	1	19-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
5.	Data independence and data base language and interfaces	1	22-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
6.	Data definitions language, DML, Overall Database Structure	1	24-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
7.	<b>Assignment/ Tutorial – I</b>	1	26-04-2021		<b>TLM3</b>	CO1		
8.	ER model	1	28-04-2021		<b>TLM1/</b>	CO1	T1,T2,R1	

	concepts-notation for ER diagram				<b>TLM2</b>			
9.	Mapping constraints, keys	1	29-04-2021		<b>TLM1</b>	CO1	T1,T2,R1	
10.	Concepts of Super Key, candidate key, primary key, Generalization, aggregation	1	1-05-2021		<b>TLM1</b>	CO1	T1,T2,R1	
11.	Reduction of an ER diagrams to tables, Extended ER model, Relationships of higher degree	1	3-05-2021		<b>TLM1/ TLM2</b>	CO1	T1,T2,R1	
12.	<b>Assignment/ Tutorial – II</b>	1	5-05-2021		<b>TLM3</b>	CO1		
No. of classes required to complete UNIT-I		12			No. of classes taken:			

### **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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Relational data model concepts	1	6-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
14.	Integrity constraints: entity integrity, referential integrity	1	8-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
15.	Keys constraints, Domain constraints	1	10-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
16.	Relational algebra	1	12-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
17.	Tutorial – III	1	13-05-2021		<b>TLM3</b>	CO2		
18.	Characteristics of SQL, Advantage of SQL	1	15-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
19.	SQL data types and literals, Types of SQL commands	1	17-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
20.	SQL operators and their procedure	1	19-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
21.	Tables, views and indexes,	1	20-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	

22.	Queries and sub queries, Aggregate functions	1	22-05-2021		<b>TLM1/ TLM2</b>	CO2	T1,T2,R1	
23.	Insert, update and delete operations	1	24-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
24.	Unions, Intersection, Minus, Cursors in SQL	1	26-05-2021		<b>TLM1</b>	CO2	T1,T2,R1	
25.	Tutorial – IV	1	27-05-2021		<b>TLM3</b>	CO2		
No. of classes required to complete <b>UNIT-2</b>		13			No. of classes taken:			

### UNIT –III: Normalization

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Functional Dependencies	1	29-05-2021	26/5,27/5	<b>TLM1</b>	CO3	T1,T2,R1	
27.	Normal Forms: First, Second	1	31-05-2021	29/5	<b>TLM1</b>	CO3	T1,T2,R1	
28.	Third Normal Forms	1	2-06-2021	31/5	<b>TLM1/ TLM2</b>	CO3	T1,T2,R1	
29.	BCNF, Inclusion Dependences	1	3-06-2021	2/6	<b>TLM1</b>	CO3	T1,T2,R1	
30.	LossLess Join Decompositions	1	5-06-2021	3/6	<b>TLM1</b>	CO3	T1,T2,R1	
31.	Tutorial – V	1	7-06-2021	5/6	<b>TLM3</b>			
32.	Normalization Using FD,MVD	1	9-06-2021	7/6	<b>TLM1</b>	CO3	T1,T2,R1	
33.	Normalization Using JD	1	10-06-2021		<b>TLM1</b>	CO3	T1,T2,R1	
34.	Alternative Approaches To Database Design	1	12-06-2021		<b>TLM1</b>	CO3	T1,T2,R1	
35.	Tutorial – VI	1	14-06-2021		<b>TLM3</b>	CO3		
No. of classes required to complete <b>UNIT-3</b>		10			No. of classes taken:			

**UNIT –IV: Transaction Processing Concepts &Concurrency Control techniques**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
36.	Transaction System	1	16-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
37.	Testing Of Serializability	1	17-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
38.	Serializability Of Schedules	1	19-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
39.	Conflict & View Serializable Schedule	1	21-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
40.	Recoverability, Log Based Recovery, Checkpoints,	1	23-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
41.	ARIES Algorithm, Deadlock Handling	1	24-06-2021		<b>TLM1/ TLM2</b>	CO4	T1,T2,R1	
42.	Tutorial –VII	1	26-06-2021		<b>TLM3</b>			
43.	Concurrency Control	1	28-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
44.	Techniques For Concurrency Control	1	30-06-2021		<b>TLM1</b>	CO4	T1,T2,R1	
45.	Time Stamping Protocols For Concurrency Control	1	01-07-2021		<b>TLM1</b>	CO4	T1,T2,R1	
46.	Locking, Validation Based Protocol	1	03-07-2021		<b>TLM1</b>	CO4	T1,T2,R1	
47.	Multiple Granularity	1	05-07-2021		<b>TLM1</b>	CO4	T1,T2,R1	
48.	Recovery With Concurrent Transactions	1	07-07-2021		<b>TLM1/ TLM2</b>	CO4	T1,T2,R1	
49.	Tutorial-IV		08-07-2021		<b>TLM3</b>	CO4		
No. of classes required to complete UNIT-4		14			No. of classes taken:			

### UNIT-V: Storage and Indexing

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
50.	RAID Levels	1	10-07-2021		<b>TLM1</b>	CO5	T1,T2,R1	
51.	Page Formats	1	12-07-2021		<b>TLM1</b>	CO5	T1,T2,R1	
52.	Record Formats	1	14-07-2021		<b>TLM1</b>	CO5	T1,T2,R1	
53.	File Types And Organization, Tutorial – IX	1	15-07-2021		<b>TLM1/ TLM3</b>	CO5	T1,T2,R1	
54.	ISAM	1	17-07-2021		<b>TLM1/ TLM2</b>	CO5	T1,T2,R1	
55.	B-Tree	1	19-07-2021		<b>TLM1</b>	CO5	T1,T2,R1	
56.	B+-Tree	1	21-07-2021		<b>TLM1/ TLM2</b>	CO5	T1,T2,R1	
57.	Tutorial – X	1	22-07-2021		<b>TLM3</b>	CO5		
No. of classes required to complete UNIT-5		08			No. of classes taken:			

### Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	CODD RULES	1	24-07-2021		<b>TLM1</b>	CO1- CO5	T1,T2,R1	

### Teaching Learning Methods

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

### ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	25/11/2019	11/01/2020	7W
Pongal Holidays	13-01-2020	18-01-2020	1W
I Mid Examinations	20/01/2020	25/01/2020	1W
II Phase of Instructions	27/01/2020	28/03/2020	9W
II Mid Examinations	30/03/2020	04/04/2020	1W
Preparation and Practicals	06/04/2020	14/04/2020	2W
Semester End Examinations	15/04/2020	30/04/2020	2W

## PART-C

### EVALUATION PROCESS (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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.

## PROGRAM SPECIFIC OUTCOMES

<b>PSO 1</b>	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
<b>PSO 2</b>	Data Engineering: To inculcate an ability to Analyse, Design and implement data driven applications into the students.
<b>PSO 3</b>	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Dr. V. NARAYANA.CH	Dr. V. NARAYANA.CH	Dr.VEERAI AH.D	Dr.VEERAI AH. I
Course Instructor	Course Coordinator	Module Coordinator	HOD



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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE HANDOUT

### PART-A

Name of Course Instructor : Mrs. K. N. V. Lakshmi.  
Course Name & Code : Linear Algebra & Numerical Applications, 17FE11  
L-T-P Structure : 3-2-0 Credits : 4  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- B A.Y : 2020-2021

**PRE-REQUISITE:** Basics of Matrix Algebra

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The objective of this course is to introduce the Matrix Algebra. The students will also gain the knowledge of numerical techniques for solving the equations and fitting of various curves.

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

CO1	Distinguish among the pros and cons between the Row operation methods and Iterative methods in solving system of linear equations.
CO2	Compute the Eigen values and Eigen vectors and powers, Inverse of a square matrix through Cayley – Hamilton theorem
CO3	Reducing the given Matrix into Diagonal form using various transformations and Transforming the Quadratic form into canonical form and identify its nature.
CO4	Application of numerical techniques fir Algebraic and Transcendental equations.
CO5	Use numerical methods for the solution of the liner system of equations and estimate the unknown dependent variables using curve fitting methods.

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

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	1	-	-	-	-	-	-	-	1
CO2	3	2	-	1	-	-	-	-	-	-	-	1
CO3	3	2	-	1	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1
CO5	3	2	-	-	-	-	-	-	-	-	-	1

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

### TEXT BOOKS:

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

### BOS APPROVED REFERENCE BOOKS:

- R1** Michael D. Greenberg , “Advanced Engineering Mathematics”, 2<sup>nd</sup> Edition, TMH, New Delhi, 2011.
- R2** Erwin Kreyszig, “Advanced Engineering Mathematics”, 8<sup>th</sup> Edition, John Wiley & Sons, New Delhi, 2011.
- R3** W.E. Boyce, R.C. DiPrima, ”Elementary Differential Equations”, 7<sup>th</sup> Edition, John Wiley and sons, New Delhi, 2001.

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN):**

#### **UNIT-I: System of Linear Equations**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course & Co's	1	12/4/21			
2.	Introduction to Unit-I	1	16/4/21		TLM1,2	
3.	Matrices - Rank	1	17/4/21		TLM1,2	
4.	Echelon form	1	19/4/21		TLM1,2	
5.	Tutorial-1	1	20/4/21		TLM3	
6.	Echelon form	1	23/4/21		TLM1,2	
7.	Normal form	1	24/4/21		TLM1,2	
8.	Normal form through PAQ	1	26/4/21		TLM1,2	
9.	Solution of Linear Systems	1	27/4/21		TLM1,2	
10.	Tutorial-2	1	28/4/21		TLM3	
11.	Non Homogeneous system of equations	1	30/4/21		TLM1,2	
12.	Non Homogeneous system of equations	1	01/5/21		TLM1,2	
13.	Homogeneous system of equations	1	03/5/21		TLM1,2	
14.	Assignment/ Quiz Unit-I	1	04/5/21		TLM6	
No. of classes required to complete Unit-I :			14	No. of classes taken:		

#### **UNIT-II: Eigen Values and Eigen Vectors**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Unit II	1	05/5/21		TLM1,2	
2.	Eigen values – Eigen Vectors	1	07/5/21		TLM1,2	
3.	Properties	1	08/5/21		TLM1,2	
4.	Properties	1	10/5/21		TLM1,2	
5.	Eigen values – Eigen Vectors	1	11/5/21		TLM1,2	
6.	Eigen values – Eigen Vectors	1	12/5/21		TLM1,2	
7.	Tutorial-3	1	15/5/21		TLM3	

8.	Cayley Hamilton Theorem	1	17/5/21		TLM1,2	
9.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	18/5/21		TLM1,2	
10.	Tutorial-4	1	19/5/21		TLM3	
11.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	21/5/21		TLM1,2	
12.	Assignment/ Quiz Unit- II	1	22/5/21		TLM6	
No. of classes required to complete Unit-II:			12	No. of classes taken:		

### UNIT-III: Linear Transformation and Diagonalization

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 Unit III	1	1/06/21		TLM1,2	
2.	Linear transformation of Matrices	1	2/06/21		TLM1,2	
3.	Orthogonal transformation of Matrices	1	4/06/21		TLM1,2	
4.	Tutorial-5	1	5/06/21		TLM3	
5.	Similarity of Matrices	1	7/06/21		TLM1,2	
6.	Diagonalization of a Matrix	1	8/06/21		TLM1,2	
7.	Orthogonal reduction of real symmetric matrices	1	9/06/21		TLM1,2	
8.	Reduction of quadratic form to canonical form	1	11/06/21		TLM1,2	
9.	Reduction of quadratic form to canonical form-Rank-Positive, Negative	1	14/06/21		TLM1,2	
10.	Definite-Semi definite-Index, Signature	1	15/06/21		TLM1,2	
11.	Definite-Semi definite-Index, Signature	1	16/06/21		TLM1,2	
12.	Assignment/Quiz Unit-III	1	18/06/21		TLM6	
13.	Tutorial-6	1	19/06/21		TLM3	
No. of classes required to complete Unit-III:			13	No. of classes taken:		

### UNIT-IV: Solution of Algebraic and Transcendental equations & Interpolation and finite Differences

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 Unit IV	1	21/06/21		TLM1,2	
2.	False Position method	1	22/06/21		TLM1,2	
3.	Newton- Raphson Method in one variable	1	23/06/21		TLM1,2	
4.	Tutorial-7	1	25/06/21		TLM3	

5.	Introduction – Finite differences	1	26/06/21		TLM1,2	
6.	Forward Differences- Backward differences –Central differences	1	28/06/21		TLM1,2	
7.	Forward Differences- Backward differences –Central differences	1	29/06/21		TLM1,2	
8.	Symbolic relations and separation of symbols	1	30/06/21		TLM1,2	
9.	Tutorial-8	1	02/07/21		TLM3	
10.	Newton’s formulae for interpolation	1	03/07/21		TLM1,2	
11.	Lagrange’s Interpolation	1	05/07/21		TLM1,2	
12.	Assignment/Quiz Unit-IV	1	06/07/21		TLM6	
No. of classes required to complete Unit-IV:			12	No. of classes taken:		

### UNIT-V : Numerical Solution of Linear System of Equations& Curve Fitting

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to UNIT V	1	07/07/21		TLM1,2	
2.	Gauss –Seidal method	1	09/07/21		TLM1,2	
3.	Gauss Jacobi Method	2	12/07/21 13/07/21		TLM1,2	
4.	Determination of EIGEN values by iteration.	1	14/07/21		TLM1,2	
5.	Fitting of a Straight line	1	16/07/21		TLM1,2	
6.	Tutorial-9	1	17/07/21		TLM3	
7.	Fitting of a second degree polynomial	1	19/07/21		TLM1,2	
8.	Fitting of exponential curves	1	20/07/21		TLM1,2	
9.	Fitting of a power curve	1	23/07/21		TLM1,2	
10.	Assignment/Quiz UNIT-V	1	24/07/21		TLM 6	
11.	Tutorial-10		24/07/21		TLM3	
No. of classes required to complete UNIT-V:			11	No. of classes taken:		

### Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Solving System of Equations using other methods	1	24/07/21		TLM1,2	
No. of classes required to complete UNIT-V:				No. of classes taken:		

<b>Teaching Learning Methods</b>			
<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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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.

Course Instructor  
(Mrs. K. N. V. Lakshmi)

Course Coordinator  
(Dr. K. R. Kavitha)

Module Coordinator  
(Dr. A. Rami Reddy)

HOD  
(Dr. A. Rami Reddy)



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)  
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

## COURSE HANDOUT

**PROGRAM** : B.Tech. IV-Sem., CSE- B  
**ACADEMIC YEAR** : 2020-21  
**COURSE NAME & CODE** : **Linux Programming -17CS01**  
**L-T-P STRUCTURE** : 3-0-0  
**COURSE CREDITS** : 3  
**COURSE INSTRUCTOR** : Dr.K. Naga Prasanthi  
**COURSE COORDINATOR** :

**PRE-REQUISITE:** Knowledge in Operating Systems

### **COURSE OBJECTIVE:**

Introduce the student to Linux kernel programming techniques. Review basic concepts covered in the core Operating Systems course prerequisite as they are realized in the Linux platform. Discuss the Process, Inter-Process Communication Techniques and Network Implementation in Linux.

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

CO1: Explore LINUX Ecosystem.

CO2: Implement Shell scripting in LINUX Kernel.

CO3: Design AWK scripts for text processing and Apply Regular Expressions for Pattern Matching.

CO4: Design Scripts for Process Creation & Network Management.

CO5: Analyze multi-processing in Linux kernel.

### **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	-	1									1	3	-	-
CO2	2	2	3									1	3	-	-
CO3	3	2	3									1	3	-	-
CO4	2	2	3									1	3	-	-
CO5	2	2	1									1	3	-	-

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

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



**TEXT BOOKS:**

- T1** Sumitabha Das., Your —Unix The Ultimate Guide, TMH Publications, 2001.
- T2** M.G. Venkatesh Murthy, —Introduction to UNIX & SHELL programming, Pearson Education, First Edition, New Delhi, 2009.

**REFERENCE BOOKS:**

- R1** B.A. Forouzan & R.F. Giberg, —Unix and shell Programming, Thomson, First Edition, New Delhi, 2003.
- R2** E. Foster – Johnson & others, —Beginning shell scripting, John Wiley & sons, First Edition, New Delhi, 2008.
- R3** Sumitabha Das, —Unix concepts and applications, TMH Publications, 4<sup>th</sup> Edition,.
- R4** Gaham Glass & K. Ables, Unix for programmers and users, pearson education, 3<sup>rd</sup> edition,.

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	<b>Introduction to LINUX:</b> Operating System concepts	1	14-04-21		TLM2	CO1	T1,T2	
2.	Introduction to LINUX, Features of LINUX	1	15-04-21		TLM2	CO1	T1,T2	
3.	LINUX Kernel, Terminal and shell	1	17-04-21		TLM2	CO1	T1,T2	
4.	The LINUX file System, File System Hierarchy	1	22-04-21		TLM2	CO1	T1,T2	
5.	File system and inodes, File Attributes, File Permissions	1	24-04-21		TLM2	CO1	T1,T2	
6.	<b>LINUX commands:</b> man, echo, script, pwd, passwd, who, uname	1	28-04-21		TLM2	CO1	T1,T2	
7.	date, sty, telnet, rlogin, ftp, more, printf	1	29-04-21		TLM2	CO1	T1,T2	
8.	PATH, SU, ps, arp, mkdir, cd, rmdir, ls, cp, rm, mv, cat, wc, lp, od	1	01-05-21		TLM2	CO1	T1,T2	
9.	ln, df, du, locate, tar, zip, chmod, unmask, mount, unmount, ulimit.	1	05-05-21		TLM2	CO1	T1,T2	
No. of classes required to complete UNIT-I		9			No. of classes taken:			

**UNIT-II:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
10.	<b>Introduction to Shell</b>	1	06-05-21		TLM2	CO2	T1,R1	
11.	Shell responsibilities, running a shell script	1	08-05-21		TLM2	CO2	T1,R1	
12.	Pipes, Redirection, Command Substitution	1	12-05-21		TLM2	CO2	T1,R2	
13.	<b>Shell Programming:</b> VI Editor	1	13-05-21		TLM2	CO2	T1,R3	
14.	the shell as a programming Language	1	15-05-21		TLM2	CO2	T1,R2	
15.	Shell Meta Characters	1	19-05-21		TLM2	CO2	T1,R2	
16.	Shell Variables, Shell Commands	1	20-05-21		TLM2	CO2	T1,R3	
17.	Control Structures, Shell Script Examples	1	22-05-21		TLM2	CO2	T1,R3	
No. of classes required to complete UNIT-II		8			No. of classes taken:			

**UNIT-III:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	<b>Filters: simple filters and commands:</b> pr,cmp	1	02-06-21		TLM2	CO3	T1,R3	
19.	comm., ulink, diff, head, tail, find	1	03-06-21		TLM2	CO3	T1	
20.	cut, paste, sort, uniq, tr, w, finger.	1	05-06-21		TLM2	CO3	T1	
21.	<b>Regular Expressions:</b> grep, egrep, fgrep	2	09-06-21 10-06-21		TLM2	CO3	T1	
22.	Sed- line addressing, context addressing	1	12-06-21		TLM2	CO3	T1	
23.	text editing, substitution.	1	16-06-21		TLM2	CO3	T1,R2	
24.	<b>Programming with awk:</b> awk statements	1	17-06-21		TLM2	CO3	T1	
25.	variables and expressions, comparison and logical operators	1	19-06-21		TLM2	CO3	T1	



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

### **EVALUATION PROCESS:**

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

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOS)**

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

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

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

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

## **PROGRAM OUTCOMES**

### **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.

#### **PROGRAM SPECIFIC OUTCOMES**

##### **1. Programming Paradigms:**

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

##### **2. Data Engineering:**

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

##### **3. Software Engineering:**

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

<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>	Dr K Naga Prasanthi		Dr. M. Srinivasa Rao	Dr. D Veeraiah
<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

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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : A.RAJAGOPAL

**Course Name & Code** : OOPs through JAVA ( 17CI07 )

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

**Credits** : 3

**Program/Sem/Sec** : B.Tech., CSE, IV-Sem., Section – B A.Y : 2020 - 2021

**PRE-REQUISITE:** Knowledge of Procedural Programming Language

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

This course concentrates on the methodological and technical aspects of software design and programming based on OOP and Acquire the basic knowledge and skills necessary to implement object-oriented programming techniques in software development through JAVA and to know about the importance of GUI based applications and the development of those Applications through JAVA and getting sufficient knowledge to enter the job market related to web development.

#### **COURSE OUTCOMES (COs):**

At the end of the course, students are able to

<b>CO1</b>	<b>Identify</b> Object Oriented concepts through constructs of JAVA.
<b>CO2</b>	<b>Analyze</b> the role of Inheritance, Polymorphism and implement Packages, Interfaces in program design using JAVA.
<b>CO3</b>	<b>Explore</b> Exception handling and Multi-threading concepts in program design using JAVA.
<b>CO4</b>	<b>Develop</b> GUI based applications using Applet class and explore the concept of Event Handling using JAVA.
<b>CO5</b>	<b>Design</b> some examples of GUI based applications using AWT controls and Swings.

#### **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	1	2	-	-	-	-	-	-	-	-	1	3	-	1
<b>CO2</b>	3	3	2	-	1	-	-	-	-	-	-	1	3	-	1
<b>CO3</b>	3	2	3	-	1	-	-	-	-	-	-	1	3	-	1
<b>CO4</b>	3	2	3	-	1	-	-	-	-	-	-	1	3	-	1
<b>CO5</b>	3	2	2	-	1	-	-	-	-	-	-	1	3	3	1

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

1- Slight (Low),

2 – Moderate (Medium),

3 - Substantial (High).

**TEXT BOOKS:**

**T1** Herbert Schildt, “Java: The complete Reference”, TMH Publications, 7<sup>th</sup> edition, 2006.

**REFERENCE BOOKS:**

- R1** Dr.R.Nageswara Rao, “Core JAVA: An Integrated Approach”, Dreamtech Press, 1<sup>st</sup> Edition, 2008.
- R2** E.Balaguruswamy, “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.
- R5** David Flanagan, “Java Examples in a nutshell – A Tutorial companion to java in a nutshell”, O’REILLY Publications, 3<sup>rd</sup> Edition, 2004.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction to Java Language and Classes**

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 Java Programming Java Basic Terminology ( JDK, JRE, JVM)	1	15.04.2021		TLM1/ TLM2	
2.	Drawbacks of POP, Object Oriented paradigm, OOP Concept	1	20.04.2021		TLM1/ TLM2	
3.	Java Buzzwords, Byte Code, Simple types	1	22.04.2021		TLM1/ TLM2	
4.	Arrays, Type Conversion and Casting	1	27.04.2021		TLM1/ TLM2	
5.	Simple Java Programs , Class Fundamentals, Declaring Objects, Access Control and recursion, Constructors	1	28.04.2021		TLM1	
6.	Garbage Collection, Programs on String and String Buffer classes and Wrapper classes	1	29.04.2021		TLM1	
7.	Tutorial – 1 / Assignment - 1	1	04.05.2021		TLM 3	
No. of classes required to complete UNIT-I: 07				No. of classes taken:		

**UNIT-II: Inheritance & Polymorphism, Packages and Interfaces**

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.	Inheritance Basics, Super Keyword, Multilevel Hierarchy,	1	05.05.2021		TLM1/ TLM2	
2.	Method Overloading & Method Overriding	1	06.05.2021		TLM1/ TLM2	
3.	Dynamic method dispatch, Abstract class, Object class and final keyword.	1	11.05.2021		TLM1/ TLM2	



4.	Package definition, Accessing package, understanding CLASSPATH	1	12.05.2021		TLM1/ TLM2	
5.	Importing Packages, java.util package	1	13.05.2021		TLM1/ TLM2	
6.	Defining, Implementing and Applying Interfaces	1	18.05.2021		TLM1/ TLM2	
7.	Variables in interface and extending interfaces, Differences between classes and interfaces	1	19.05.2021		TLM1/ TLM2	
8.	Tutorial – 2 / Assignment - 2	1	20.05.2021		TLM3	
No. of classes required to complete UNIT-II: 08				No. of classes taken:		

### UNIT-III: Exception Handling, Multithreading

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.	Exception Handling Fundamentals, Exception types	1	01.06.2021		TLM1/ TLM2	
2.	Usage of try & catch , throws and finally	1	02.06.2021		TLM1/ TLM2	
3.	Java Built-in Exceptions	1	03.06.2021		TLM1/ TLM2	
4.	Differences between multi-threading and multi-tasking.	1	08.06.2021		TLM1/ TLM2	
5.	Java thread model Creating thread	1	09.06.2021		TLM1/ TLM2	
6.	Multiple threads, Synchronizing threads	1	10.06.2021		TLM1/ TLM2	
7.	Tutorial – 3 / Assignment - 3	1	15.06.2021		TLM3	
No. of classes required to complete UNIT-III: 07				No. of classes taken:		

### UNIT-IV : Applet class and 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
1.	Concepts of Applets, Differences between Applets and Applications	1	16.06.2021		TLM1/ TLM2	
2.	Applet Architecture, skeleton and creation.	1	17.06.2021		TLM1/ TLM2	
3.	Passing parameters to applets and working with graphics class.	1	22.06.2021		TLM1/ TLM2	
4.	Event handling mechanisms, Events and Event sources.	1	23.06.2021		TLM1/ TLM2	
5.	Event class, Listener interface, Delegation event model.	1	24.06.2021		TLM1/ TLM2	
6.	Keyboard and Mouse Events, Adapter class, Inner class.	1	29.06.2021		TLM1/ TLM2	
7.	Tutorial – 4 / Assignment - 4	1	30.06.2021		TLM3	
No. of classes required to complete UNIT-IV: 07				No. of classes taken:		

**UNIT-V : AWT Controls and Introduction to Swings**

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.	Label, button, Scrollbars, Text Components	1	01.07.2021		TLM1/ TLM2	
2.	Check Box, Check Box groups, choices, controls, lists	1	06.07.2021		TLM1/ TLM2	
3.	Scrollbar, Text field, Layout Managers – border, grid, flow	1	07.07.2021		TLM1/ TLM2	
4.	Introduction to swing, Key features, Limitations of AWT	1	08.07.2021		TLM1/ TLM2	
5.	Components and Containers, Swing packages.	1	13.07.2021		TLM1/ TLM2	
6.	Creating Swing applet.	1	14.07.2021		TLM1/ TLM2	
7.	JApplet class, JComponents – Labels, Text fields, buttons	1	15.07.2021		TLM1/ TLM2	
8.	Jbutton class, Tabbed Panes, Scroll Panes, Tables	1	20.07.2021		TLM1/ TLM2	
9.	Tutorial – 5 / Assignment - 5	1	22.07.2021		TLM3	
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

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

**PART-C****EVALUATION PROCESS (R17 Regulations):**

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

Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
A.RAJA GOPAL	DR. Y.V.BHASKAR REDDY	DR. D.VEERAI AH	DR. D.VEERAI AH



# 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.

<http://cse.lbrce.ac.in>, [cse.lbreddy@gmail.com](mailto:cse.lbreddy@gmail.com), Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

<b>PROGRAM</b>	: B.Tech. IV-Sem., CSE
<b>ACADEMIC YEAR</b>	: 2020-21
<b>COURSE NAME &amp; CODE</b>	: SOFTWARE ENGINEERING & 17CI10
<b>L-T-P STRUCTURE</b>	: 3-0-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: B. USHA RANI
<b>COURSE COORDINATOR</b>	: Dr. P. ASHOK REDDY

1. **Pre-requisites:** Concepts of programming and Database Management Systems.

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

An understanding of different software processes and how to choose between them. How to understand requirements from a client and specify them. Design in the large, including principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns. Knowing various quality assurance techniques, including unit testing, integration testing and functional testing.

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

**S381.1: Understand the fundamentals of software engineering concepts and software process standards**

**S381.2: Demonstrate appropriate process models and software engineering practices**

**S381.3: Analyze requirements of software system and explore all requirements gathering approaches**

**S381.4: Create an architectural design using standard design processes**

**S381.5: Apply software testing strategies and tactics for testing real time projects effective**

#### 4. Course Articulation Matrix:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
S381.1	1	3	1	-	-	1	-	-	-	-	1	1	-	-	3
S381.2	1	3	2	-	-	1	-	1	-	-	-	-	-	-	3
S381.3	1	3	2	-	1	1	1	1	1	1	-	-	-	1	3
S381.4	2	3	3	-	1	1	1	1	-	-	-	1	-	-	3
S381.5	1	3	3	-	1	1	-	1	-	-	1	1	2	-	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 BOOK:

- Roger S. Pressman, Software Engineering – A Practitioner’s Approach, Mc. Graw-Hill International Edition, 6<sup>th</sup> Edition, 2005.

#### REFERENCES:

1. Ian Sommerville, “Software Engineering”, Pearson Education, 8<sup>th</sup> Edition, 2008.
2. Ali Behforooz and Frederick J. Hudson, “Software Engineering Fundamentals”, Oxford University Press, New Delhi, 1996.
3. Stephan Schach, “Software Engineering”, Tata Mc. Graw-Hill, 2007.
4. Pfleeger and Lawrence, “Software Engineering: Theory and Practice”, Pearson Education, Second Edition, 2001, 1995, PHI.

#### Web link:

[http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman\\_\\_Software\\_Engineering.pdf](http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman__Software_Engineering.pdf)

## COURSE DELIVERY PLAN (LESSON PLAN): Section-B

### UNIT –I:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Software Engineering & Evolving role of Software	1	14/04/2021	14/04/2021	TLM2	CO1	T1	
2.	Software Definition and Characteristics & Changing nature of Software	1	15/04/2021	15/04/2021	TLM2	CO1	T1	
3.	Legacy Software and Its Quality	1	20/04/2021	20/04/2021	TLM2	CO1	T1	
4.	Software Myths	1	21/04/2021	21/04/2021	TLM2	CO1	T1	
5.	Software Process: Definition and Differences & Software Engineering – A layered technology	1	22/04/2021	22/04/2021	TLM2	CO1	T1,R1	
6.	Process Framework – Generic Framework Activities & Umbrella Activities	1	27/04/2021	27/04/2021	TLM2	CO1	T1,R1	
7.	CMMI Model	1	28/05/2021	28/05/2021	TLM2	CO1	T1,R1	
8.	Process Patterns & Process Assessment and Approaches	1	29/05/2021	29/05/2021	TLM2	CO1	T1,R1	
9.	Software Process Models, Process Technology & Product and Process	1	04/05/2021	04/05/2021	TLM2	CO1	T1	
10.	<b>ASSIGNMENT-1</b>	1			TLM3	CO1	T1	
No. of classes required to complete UNIT-I		<b>10</b>			No. of classes taken:			

**UNIT –II:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
11.	Process Models: Prescriptive Models & Waterfall Model	1	05/05/2021	05/05/2021	TLM2	CO2	T1	
12.	Incremental Model & RAD Model	1	06/05/2021	06/05/2021	TLM2	CO2	T1	
13.	Evolutionary Process Models	1	11/05/2021	11/05/2021	TLM2	CO2	T1	
14.	Specialized Process Models & Unified Process	1	12/05/2021	12/05/2021	TLM2	CO2	T1	
15.	Software Engineering Practices: Communication Practices	1	13/05/2021	13/05/2021	TLM2		T1	
16.	Planning Practices, Modeling Practice & Construction Practice& Deployment	1	18/05/2021	18/05/2021	TLM2	CO2	T1,R1	
17.	<b>ASSIGNMENT-2</b>	1			TLM3	CO2	T1	
No. of classes required to complete <b>UNIT-2</b>		<b>7</b>			No. of classes taken:			

**UNIT –III:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Requirements Engineering: Description, RE Tasks	1	19/05/2021	19/05/2021	TLM2	CO3	T1	
19.	Initiating the RE Process	1	20/05/2021	20/05/2021	TLM2	CO3	T1	
20.	Eliciting Requirements , Developing Use-Cases	1	01/06/2021	01/06/2021	TLM2	CO3	T1	
21.	Building the Analysis Models	1	02/06/2021	02/06/2021	TLM2	CO3	T1,R1	
22.	Negotiating and Validating Requirements	1	03/06/2021	03/06/2021	TLM2	CO3	T1,R1	
23.	Building the Analysis Model: Requirements Analysis	1	08/06/2021	08/06/2021	TLM2		T1,R1	
24.	Analysis Modeling Approaches & Data Modeling Concepts	1	09/06/2021	09/06/2021	TLM2	CO3	T1	
25.	Object Oriented Analysis,	1	10/06/2021	10/06/2021	TLM2	CO3	T1	

	Scenario Based Modeling							
26.	Flow Oriented Modeling, Class Based Modeling, Creating a Behavioral Model	1	15/06/2021	15/06/2021	<b>TLM2</b>	CO3	T1	
27.	<b>ASSIGNMENT-3</b>	1			<b>TLM3</b>	CO3	T1	
No. of classes required to complete <b>UNIT-3</b>		<b>10</b>			No. of classes taken:			

**UNIT –IV:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Design Engineering: Design within context of Software Engineering	1	16/06/2021	16/06/2021	<b>TLM2</b>	CO4	T1	
29.	Design Process and Design Quality	1	17/06/2021	17/06/2021	<b>TLM2</b>	CO4	T1	
30.	Design Concepts	1	22/06/2021	22/06/2021	<b>TLM2</b>	CO4	T1	
31.	Design Model	1	23/06/2021	23/06/2021	<b>TLM2</b>	CO4	T1,R1	
32.	Pattern Based Software Design	1	24/06/2021	24/06/2021	<b>TLM2</b>	CO4	T1,R1	
33.	Software Architecture and Data Design	1	29/06/2021	29/06/2021	<b>TLM2</b>	CO4	T1	
34.	Architectural Styles and Patterns, Architectural Design	1	30/06/2021	30/06/2021	<b>TLM2</b>	CO4	T1	
35.	<b>ASSIGNMENT-4</b>	1			<b>TLM3</b>	CO4	T1,R1	
No. of classes required to complete <b>UNIT-4</b>		<b>8</b>			No. of classes taken:			



**UNIT-V:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
36.	A Strategic Approach to Software Testing & Strategic Issues	1	01/07/2021	01/07/2021	<b>TLM2</b>	CO5	T1	
37.	Test Strategies for Conventional Software	1	06/07/2021	06/07/2021	<b>TLM2</b>	CO5	T1	
38.	Test Strategies for Object Oriented Software	1	07/07/2021	07/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
39.	Validation Testing & System Testing, The art of Debugging	1	08/07/2021	08/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
40.	Software Testing Fundamentals	1	13/07/2021	13/07/2021	<b>TLM2</b>	CO5	T1	
41.	White Box Testing & Basis Path Testing	1	14/07/2021	14/07/2021	<b>TLM2</b>	CO5	T1	
42.	Control Structure and Black Box Testing	1	15/07/2021	15/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
43.	OO- Testing Methods	1	20/07/2021	20/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
44.	<b>ASSIGNMENT-5</b>				<b>TLM3</b>	CO5	T1,R1,R2	
No. of classes required to complete <b>UNIT-5</b>		<b>8</b>			No. of classes taken:			

**Teaching Learning Methods5**

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

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

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

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

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

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

## **PROGRAMME OUTCOMES (POs):**

### **Engineering Graduates will be able to:**

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

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

## **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

### **1. Programming Paradigms:**

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

### **2. Data Engineering:**

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

### **3. Software Engineering:**

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

Course Instructor

Course Coordinator

Module Coordinator

HOD



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

## COURSE HANDOUT

Name of Course Instructor : Dr CH V NARAYANA  
Course Name & Code : Database Management Systems Lab-17CI64  
L-T-P Structure : 0-0-2 Credits : 1  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- B A.Y : 2020-2021

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**The major objective of this lab is to provide a strong formal foundations in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

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

CO1	Design & implement a database schema for a given problem-domain.
CO2	Create database using SQL and implement various integrity constraints.
CO3	Apply PL/SQL Programming for problem solving.
CO4	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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

## **Part-B**

### **CYCLE-1**

**1) Create a table STUDENT with appropriate data types and perform the following queries.**

**Roll number, student name, date of birth, branch and year of study.**

1. Insert 5 to 10 rows in a table?
2. List all the students of all branches
3. List student names whose name starts with 's'
4. List student names whose name contains 's' as third literal
5. List student names whose contains two 's' anywhere in the name
6. List students whose branch is NULL
7. List students of CSE & ECE who born after 1980
8. List all students in reverse order of their names
9. Delete students of any branch whose name starts with 's'
10. Update the branch of CSE students to ECE
11. Display student name padded with '\*' after the name of all the students

**2) Create the following tables based on the above Schema Diagram with appropriate data types and constraints and perform the following queries.**

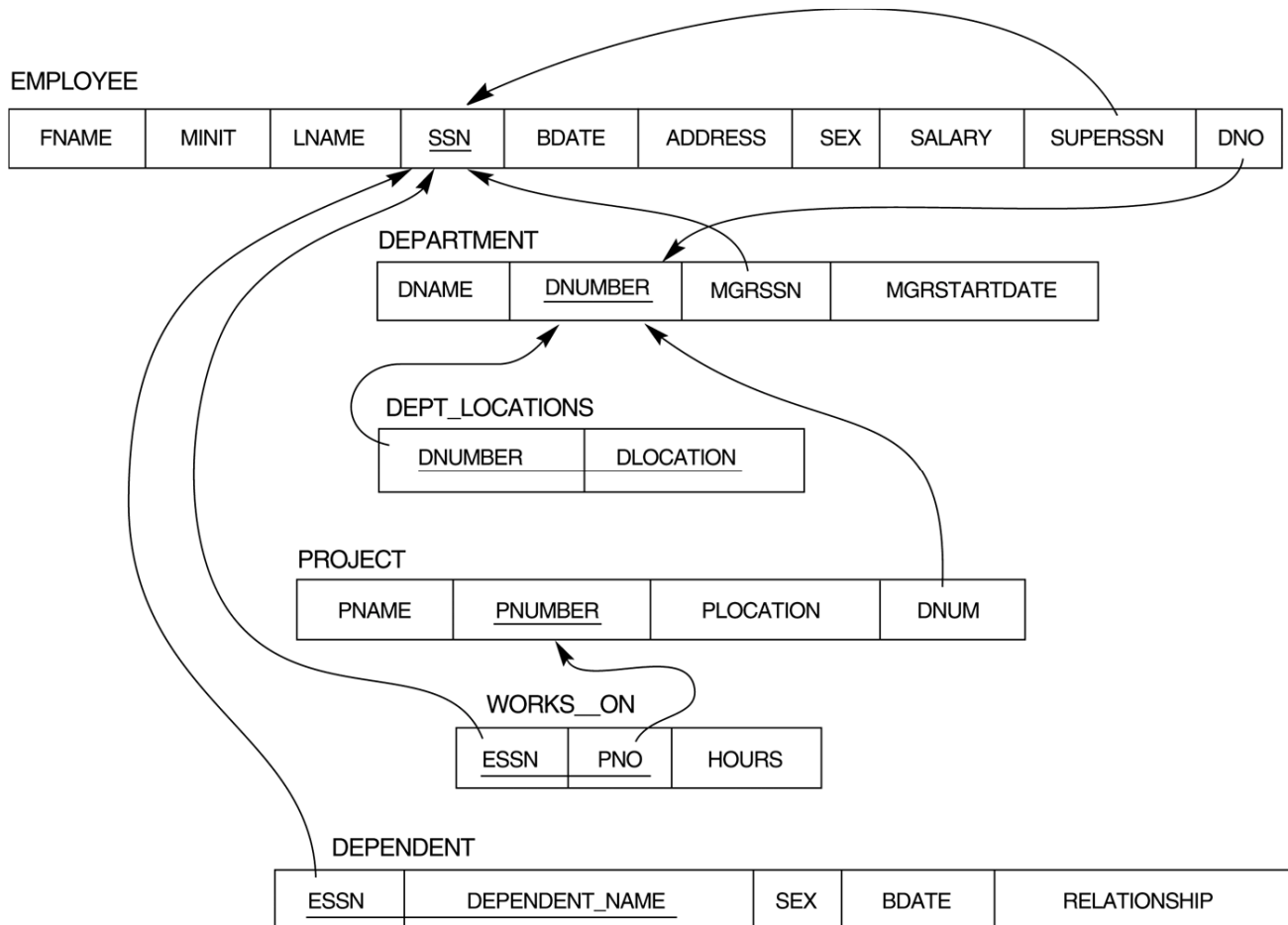
**SAILORS** (Sailid, Salname, Rating, Age)

**RESERVES** (Sailid, boatid, Day)

**BOATS** (Boatid, Boat-name, Color)

1. Insert 5 to 10 rows in all tables?
2. Find the name of sailors who reserved boat number 3.
3. Find the name of sailors who reserved green boat.
4. Find the colors of boats reserved by "Ramesh".
5. Find the names of sailors who have reserved atleast one boat.
6. Find the all sailid of sailors who have a rating of 10 or have reserved boated 104.
7. Find the Sailid's of sailors with age over 20 who have not registered a red boat.
8. Find the names of sailors who have reserved a red or green boat.
9. Find sailors whose rating is better than some sailor called 'Salvador'.
10. Find the names of sailors who are older than the oldest sailor with a rating of 10.

### 3) Schema Diagram for the rest of the SQL and PLSQL Programs.



Create the following tables based on the above Schema Diagram with appropriate data types and constraints.

**EMPLOYEE** (Fname, Mname, Lname, SSN, Bdate, Address, Gender, Salary, SuperSSN, Dno)

**DEPARTMENT**(Dnumber, Dname, MgrSSN, Mgrstartdate)

**DEPENDENT** (ESSN, Dependent\_Name, Gender, Bdate, Relationship)

- 1) Insert 5 to 10 rows into all the tables.
- 2) Display all employee's names along with their department names.
- 3) Display all employee's names along with their dependent details.
- 4) Display name and address of all employees who work for 'ECE' department.
- 5) List the names of all employees with two or more dependents.
- 6) List the names of employee who have no dependents.
- 7) List the names of employees who have at least one dependent.
- 8) List the names of the employees along with names of their supervisors using aliases.
- 9) Display name of the department and name of manager for all the departments.
- 10) Display the name of each employee who has a dependent with the same first name

and gender as the employee.

- 11) List the names of managers who have at least one dependent.
- 12) Display the sum of all employees' salaries as well as maximum, minimum and average salary in the entire departments department wise if the department has more than two employees.
- 13) List the departments of each female employee along with her name.
- 14) List all employee names and also the name of the department they manage if they happen to manage a dept.
- 15) Display the name of the employee and his / her supervisor's name.

**4) Create the following tables based on the above Schema Diagram with appropriate data types and constraints in addition to the tables in Experiment 2.**

DEPT\_LOCATIONS (Dnumber, Dlocation)

PROJECT (Pname, Pnumber, Plocation, Dnum)

WORKS\_ON(ESSN, Pno, Hours).

- 1) Insert 5 to 10 rows into all the tables.
- 2) Find the names of the employees who work on all the projects controlled by the department 'ECM'.
- 3) List the project number, name and no. Of employees who work on that project for all the projects.
- 4) List the names of all the projects controlled by the departments department wise.
- 5) Retrieve the names of employees who work on all projects that 'John' works on.
- 6) List the project numbers for projects that involve an employee either as worker or as a manager of the department that controls the project.
- 7) List the names of all employees in one department who work more than 10 hours on one specific project.
- 8) For each project, list the project name and total hours (by all employees) spent on that project.
- 9) Retrieve the names of all employees who work on every project.
- 10) Retrieve the names of all employees who do not work on any project.
- 11) Display the name and total no. of hours worked by an employee who is working on maximum no. of projects among all the employees.
- 12) Display the names of all employees and also no. of hours, project names that they work on if they happen to work on any project(use outer join).
- 13) List the employee name, project name on which they work and the department they belong to for all the employees using alias names for the resulting columns.
- 14) Retrieve the names of all employees who work on more than one project department wise.
- 15) List all the departments that contain at least one occurrence of 'C' in their names.

**5) Create a view that has project name, controlling department name, number of employees and total hours worked on the project for each project with more than one employee working on it.**

- 1) List the projects that are controlled by one department from this view.

- 2) List the managers of the controlling departments for all the projects.
- 3) Demonstrate one update operation on this view.
- 4) List the Location of the controlling departments for all the projects.
- 5) Retrieve the data from the view.

## **PL/SQL LAB CYCLE**

### **CYCLE-II**

6. Write a PL/SQL Block to find whether the number is Armstrong or not.
7. Write a PL/SQL program for generating Fibonacci series
8. Write an anonymous PL/SQL block that fetches and displays the data from employee table to the console.
9. Write a program that updates salaries of all employees with 10 % hike (use cursors).
10. Write a program to fetch salary and employee name from employee table for a given user input. When no data found raise an exception that prints the message “no data found”.
11. Write a program to find the number of records of any given table using % ROWCOUNT.
12. Write a cursor to display the list of employees and total salary department wise.
13. Write a database trigger on employee table so that the trigger fires when all the DML statements are executed (print appropriate message).
14. Write a trigger in such a way that it should not allow insert or update or delete on Wednesday and Thursday and display the proper message.
15. Write a procedure to display the name and salary of employee when user inputs SSN using IN/OUT parameters.
16. Write a function to check the validity of the given employee number from the employee table (print the appropriate message using PL/SQL block).
17. Visit TPC and submit report.

### **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	Learning Outcome COs	HOD Sign Weekly
1	Introduction to DBMS	2	16-04-2021		TLM8	CO1	
2	<b>CYCLE-I : EXP-1</b>	2	23-04-2021		TLM8	CO1,CO4	
3	EXP-2	2	30-04-2021		TLM8	CO1,CO4	
4	EXP-3	2	7-05-2021		TLM8	CO1,CO4	
5	EXP-4	2	21-05-2021		TLM8	CO1,CO4	
6	EXP-5	2	28-05-2021		TLM8	CO1,CO4	
7	<b>CYCLE-II : EXP-6, EXP7</b>	2	4-06-2021		TLM8	CO1,CO4	
8	EXP-8, EXP9	2	11-06-2021		TLM8	CO2,CO4	



9	EXP-10, EXP11	2	18-06-2021		TLM8	CO2,CO4
10	EXP-12	2	25-06-2021		TLM8	CO2,CO4
11	EXP-13	2	11-06-2021		TLM8	CO2,CO4
12	EXP-14	2	2-07-2021		TLM8	CO3,CO4
13	EXP-15	2	9-07-2021		TLM8	CO3,CO4
14	EXP-16, EXP17	2	16-07-2021		TLM8	CO3,CO4
15	Internal Exam					

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

## PROGRAM OUTCOMES

### Engineering Graduates will be able to:

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

societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

### PROGRAM SPECIFIC OUTCOMES

1. **Programming Paradigms:** To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
2. **Data Engineering:** To inculcate an ability to Analyse, Design and implement data driven applications into the students.
3. **Software Engineering:** Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Dr.V. NARAYANA.CH	Dr.V. NARAYANA.CH	Dr.VEERAI AH.D	Dr.VEERAI AH. D
Course Instructor	Course Coordinator	Module Coordinator	HOD





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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

## COURSE HANDOUT

### Part-A

<b>PROGRAM</b>	: B.Tech., IV-Sem., CSE - B
<b>ACADEMIC YEAR</b>	: 2020-21
<b>COURSE NAME &amp; CODE</b>	: <b>Linux Programming Lab-17CS61</b>
<b>L-T-P STRUCTURE</b>	: 0-0-2
<b>COURSE CREDITS</b>	: 1
<b>COURSE INSTRUCTOR</b>	: <b>Dr. K Naga Prasanthi</b>
<b>COURSE COORDINATOR</b>	:
<b>PRE-REQUISITES</b>	: Programming Knowledge

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** To familiarize students with the Linux environment and to learn the fundamentals of shell scripting/programming.

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

CO1: Apply built in commands for file processing.

CO2: Design and implement Linux shell scripts.

CO3: Design and implement AWK scripts.

CO4: Develop programs to implement system calls.

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

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

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

## Part-B

### COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1	Introduction to LINUX OS.	2	17-04-21		TLM4/TLM5	CO1	
2	Week1 experiment	2	24-04-21		TLM4/TLM5	CO1	
3	Week2 experiment	2	01-05-21		TLM4/TLM5	CO1	
4	Week3 experiment	2	08-05-21		TLM4/TLM5	CO2	
5	Week4 experiment	2	15-05-21		TLM4/TLM5	CO2	
6	Week5 experiment	2	22-05-21		TLM4/TLM5	CO2	
7	Week6 experiment	2	29-05-21		TLM4/TLM5	CO2	
8	Week7 experiment	2	05-06-21		TLM4/TLM5	CO2	
9	Week8 experiment	2	12-06-21		TLM4/TLM5	CO2	
10	Week9 experiment	2	19-06-21		TLM4/TLM5	CO3	
11	Week10 experiment	2	26-06-20		TLM4/TLM5	CO4	
12	Week11 experiment	2	03-07-21		TLM4/TLM5	CO4	
13	Week12 experiment	2	17-07-21		TLM4/TLM5	CO4	
14	<b>Lab Internal Examination</b>	2	24-07-21		TLM4/TLM5		

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

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOS)**

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

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

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

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

## **PROGRAM OUTCOMES**

### **Engineering Graduates will be able to:**

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

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

## **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

### **1. Programming Paradigms:**

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

### **2. Data Engineering:**

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

### **3. Software Engineering:**

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

	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	Dr. K Naga Prasanthi		Dr. M. Srinivasa Rao	Dr. D Veeraiah
<b>Signature</b>				



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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : A.RAJAGOPAL

Course Name & Code : OOPs through JAVA LAB ( 17CI65 )

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

Program/Sem/Sec : B.Tech., CSE, IV-Sem., Section – B A.Y : 2020 - 2021

#### PRE-REQUISITE: C PROGRAMMING

#### COURSE OBJECTIVE:

Concentrates on the methodological and technical aspects of software design and programming based on OOP. Acquire the basic knowledge and skills necessary to implement object oriented programming techniques in software development through java. Know about the importance of GUI based applications and the development of applications through java.

#### COURSE OUTCOMES (COs)

At the end of the course, the student will be able to:

CO1	Implement and Test the concepts of OOP in program design with a few example exercises.
CO2	Implement and Test the performance of Exception handling, Multithreading concepts with a few examples.
CO3	Implement and Test the performance of GUI based applications using AWT, Swings.
CO4	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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



## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Java programming	2	12.04.2021		TLM4	
2.	Introduction to Java Compiler	2	19.04.2021		TLM4	
3.	Programs on Basic control structures & Loops	2	26.04.2021		TLM4	
4.	Programs on Basic control structures & Loops	2	03.05.2021		TLM4	
5.	Programs on recursion	2	10.05.2021		TLM4	
6.	Programs on Arrays	2	17.05.2021		TLM4	
7.	Programs on Constructors & Method Overloading	2	31.05.2021		TLM4	
8.	Programs on String & String Buffer classes	2	07.06.2021		TLM4	
9.	Programs on Inheritance , super and final keyword	2	14.06.2021		TLM4	
10.	Programs on Run-Time Polymorphism, Packages and Interfaces	2	21.06.2021		TLM4	
11.	Programs on Exception Handling & Multithreading	2	28.06.2021		TLM4	
12.	Programs on Applets & Event Handling	2	05.07.2021		TLM4	
13.	Programs on Applets & Event Handling	2	12.07.2021		TLM4	
14.	Programs on AWT Components & Layout Managers, Programs on Swings	2	19.07.2021		TLM4	

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

**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 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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
A.RAJA GOPAL	DR.Y.V.BHASKAR REDDY	DR. D.VEERAI AH	DR. D.VEERAI AH



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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : A.RAJAGOPAL  
**Course Name & Code** : OOPs through JAVA ( 17CI07 )  
**L-T-P Structure** : 3-0-0 Credits: 3  
**Program/Sem/Sec** : B.Tech., CSE, IV-Sem., Section – C A.Y : 2020 - 2021

**PRE-REQUISITE:** Knowledge of Procedural Programming Language

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

This course concentrates on the methodological and technical aspects of software design and programming based on OOP and Acquire the basic knowledge and skills necessary to implement object-oriented programming techniques in software development through JAVA and to know about the importance of GUI based applications and the development of those Applications through JAVA and getting sufficient knowledge to enter the job market related to web development.

#### **COURSE OUTCOMES (COs):**

At the end of the course, students are able to

<b>CO1</b>	<b>Identify</b> Object Oriented concepts through constructs of JAVA.
<b>CO2</b>	<b>Analyze</b> the role of Inheritance, Polymorphism and implement Packages, Interfaces in program design using JAVA.
<b>CO3</b>	<b>Explore</b> Exception handling and Multi-threading concepts in program design using JAVA.
<b>CO4</b>	<b>Develop</b> GUI based applications using Applet class and explore the concept of Event Handling using JAVA.
<b>CO5</b>	<b>Design</b> some examples of GUI based applications using AWT controls and Swings.

#### **COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSO's):**

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

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

1- Slight (Low),

2 – Moderate (Medium),

3 - Substantial (High).

**TEXT BOOKS:**

**T1** Herbert Schildt, “Java: The complete Reference”, TMH Publications, 7<sup>th</sup> edition, 2006.

**REFERENCE BOOKS:**

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

**R2** E.Balaguruswamy, “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.

**R5** David Flanagan, “Java Examples in a nutshell – A Tutorial companion to java in a nutshell”, O’REILLY Publications, 3<sup>rd</sup> Edition, 2004.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction to Java Language and Classes**

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 Java Programming Java Basic Terminology (JDK, JRE, JVM)	1	12.04.2021		TLM1/ TLM2	
2.	Drawbacks of POP, Object Oriented paradigm, OOP Concept	1	17.04.2021		TLM1/ TLM2	
3.	Java Buzzwords, Byte Code, Simple types	1	19.04.2021		TLM1/ TLM2	
4.	Arrays, Type Conversion and Casting	1	24.04.2021		TLM1/ TLM2	
5.	Simple Java Programs , Class Fundamentals,	1	26.04.2021		TLM1	
6.	Declaring Objects, Access Control and recursion, Constructors	1	28.04.2021		TLM1/ TLM2	
7.	Garbage Collection, Programs on String and String Buffer classes and Wrapper classes	1	01.05.2021		TLM1	
8.	Tutorial – 1 / Assignment - 1	1	03.05.2021		TLM 3	
No. of classes required to complete UNIT-I: 08				No. of classes taken:		

**UNIT-II: Inheritance & Polymorphism, Packages and Interfaces**

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.	Inheritance Basics, Super Keyword, Multilevel Hierarchy,	1	05.05.2021		TLM1/ TLM2	
2.	Method Overloading & Method Overriding	1	08.05.2021		TLM1/ TLM2	
3.	Dynamic method dispatch, Abstract class, Object class and final keyword.	1	10.05.2021		TLM1/ TLM2	
4.	Package definition, Accessing package, understanding	1	12.05.2021		TLM1/ TLM2	

CLASSPATH						
5.	Importing Packages, java.util package	1	15.05.2021		TLM1/ TLM2	
6.	Defining, Implementing and Applying Interfaces	1	17.05.2021		TLM1/ TLM2	
7.	Variables in interface and extending interfaces, Differences between classes and interfaces	1	19.05.2021		TLM1/ TLM2	
8.	Tutorial – 2 / Assignment - 2	1	22.05.2021		TLM3	
No. of classes required to complete UNIT-II: 08				No. of classes taken:		

### UNIT-III: Exception Handling, Multithreading

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.	Exception Handling Fundamentals, Exception types	1	31.05.2021		TLM1/ TLM2	
2.	Usage of try & catch , throws and finally		02.06.2021			
3.	Java Built-in Exceptions	1	05.06.2021		TLM1/ TLM2	
4.	Differences between multi-threading and multi-tasking.	1	07.06.2021		TLM1/ TLM2	
5.	Java thread model Creating thread	1	09.06.2021		TLM1/ TLM2	
6.	Multiple threads, Synchronizing threads	1	12.06.2021		TLM1/ TLM2	
7.	Tutorial – 3 / Assignment - 3	1	14.06.2021		TLM3	
No. of classes required to complete UNIT-III: 07				No. of classes taken:		

### UNIT-IV : Applet class and 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
1.	Concepts of Applets, Differences between Applets and Applications	1	16.06.2021		TLM1/ TLM2	
2.	Applet Architecture, skeleton and creation.	1	19.06.2021		TLM1/ TLM2	
3.	Passing parameters to applets and working with graphics class.	1	21.06.2021		TLM1/ TLM2	
4.	Event handling mechanisms, Events and Event sources.	1	23.06.2021		TLM1/ TLM2	
5.	Event class, Listener interface, Delegation event model.	1	26.06.2021		TLM1/ TLM2	
6.	Keyboard and Mouse Events, Adapter class, Inner class.	1	28.06.2021		TLM1/ TLM2	
7.	Tutorial – 4 / Assignment - 4	1	30.06.2021		TLM3	
No. of classes required to complete UNIT-IV: 07				No. of classes taken:		

### UNIT-V : AWT Controls and Introduction to Swings

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.	Label, button, Scrollbars, Text Components	1	03.07.2021		TLM1/ TLM2	
2.	Check Box, Check Box groups, choices, controls, lists	1	05.07.2021		TLM1/ TLM2	
3.	Scrollbar, Text field, Layout Managers – border, grid, flow	1	07.07.2021		TLM1/ TLM2	
4.	Introduction to swing, Key features, Limitations of AWT	1	10.07.2021		TLM1/ TLM2	
5.	Components and Containers, Swing packages.	1	12.07.2021		TLM1/ TLM2	
6.	Creating Swing applet.	1	14.07.2021		TLM1/ TLM2	
7.	JApplet class, JComponents – Labels, Text fields, buttons	1	17.07.2021		TLM1/ TLM2	
8.	Jbutton class, Tabbed Panes, Scroll Panes, Tables	1	19.07.2021		TLM1/ TLM2	
9.	Tutorial – 5 / Assignment - 5	1	24.07.2021		TLM3	
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

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

### PART-C

#### EVALUATION PROCESS (R17 Regulations):

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

**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 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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
A.RAJA GOPAL	DR.Y.V.BHASKAR REDDY	DR. D.VEERAI AH	DR. D.VEERAI AH



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE HANDOUT

### PART-A

Name of Course Instructor : G. Vijaya Lakshmi.  
Course Name & Code : Linear Algebra & Numerical Applications, 17FE11  
L-T-P Structure : 3-2-0 Credits : 4  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-2021

**PRE-REQUISITE:** Basics of Matrix Algebra

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The objective of this course is to introduce the Matrix Algebra. The students will also gain the knowledge of numerical techniques for solving the equations and fitting of various curves.

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

CO1	Distinguish among the pros and cons between the Row operation methods and Iterative methods in solving system of linear equations.
CO2	Compute the Eigen values and Eigen vectors and powers, Inverse of a square matrix through Cayley – Hamilton theorem
CO3	Reducing the given Matrix into Diagonal form using various transformations and Transforming the Quadratic form into canonical form and identify its nature.
CO4	Application of numerical techniques fir Algebraic and Transcendental equations.
CO5	Use numerical methods for the solution of the liner system of equations and estimate the unknown dependent variables using curve fitting methods.

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

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	1	-	-	-	-	-	-	-	1
CO2	3	2	-	1	-	-	-	-	-	-	-	1
CO3	3	2	-	1	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1
CO5	3	2	-	-	-	-	-	-	-	-	-	1

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

#### TEXT BOOKS:

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

#### BOS APPROVED REFERENCE BOOKS:



- R1** Michael D. Greenberg , “Advanced Engineering Mathematics”, 2<sup>nd</sup> Edition, TMH, New Delhi, 2011.
- R2** Erwin Kreyszig, “Advanced Engineering Mathematics”, 8<sup>th</sup> Edition, John Wiley & Sons, New Delhi, 2011.
- R3** W.E. Boyce, R.C. DiPrima, ”Elementary Differential Equations”, 7<sup>th</sup> Edition, John Wiley and sons, New Delhi, 2001.

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN):**

#### **UNIT-I: System of Linear Equations**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
9.	Introduction to Course & Co's	1	15/4/21				
10.	Introduction to Unit-I	1	16/4/21		TLM1		
11.	Matrices - Rank	1	17/4/21		TLM1		
12.	Echelon form	1	20/4/21		TLM1		
13.	Tutorial-1	1	22/4/21		TLM3		
14.	Echelon form	1	23/4/21		TLM1		
15.	Normal form	1	24/4/21		TLM1		
16.	Normal form through PAQ	1	27/4/21		TLM1		
17.	Solution of Linear Systems	1	28/4/21		TLM1		
18.	Tutorial-2	1	29/4/21		TLM3		
19.	Non Homogeneous system of equations	1	30/4/21		TLM1		
20.	Non Homogeneous system of equations	1	01/5/21		TLM1		
21.	Homogeneous system of equations	1	04/5/21		TLM1		
22.	Assignment/ Quiz Unit-I	1	05/5/21		TLM6		
No. of classes required to complete Unit-I :			14	No. of classes taken:			

#### **UNIT-II: Eigen Values and Eigen Vectors**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Introduction to Unit II	1	06/5/21		TLM1	
10.	Eigen values – Eigen Vectors	1	07/5/21		TLM1	
11.	Properties	1	08/5/21		TLM1	
12.	Properties	1	11/5/21		TLM1	
13.	Eigen values – Eigen Vectors	1	12/5/21		TLM1	
14.	Eigen values – Eigen Vectors	1	13/5/21		TLM1	
15.	Tutorial-3	1	15/5/21		TLM3	

16.	Cayley Hamilton Theorem	1	18/5/21		TLM1
17.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	19/5/21		TLM1
18.	Tutorial-4	1	20/5/21		TLM3
19.	Inverse and Powers of a matrix by using Cayley Hamilton Theorem.	1	21/5/21		TLM1
20.	Assignment/ Quiz Unit- II	1	22/5/21		TLM6
No. of classes required to complete Unit-II:			12	No. of classes taken:	

### UNIT-III: Linear Transformation and Diagonalization

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Introduction to Unit III	1	1/06/21		TLM1	
9.	Linear transformation of Matrices	1	2/06/21		TLM1	
10.	Orthogonal transformation of Matrices	1	3/06/21		TLM1	
11.	Tutorial-5	1	4/06/21		TLM3	
12.	Similarity of Matrices	1	5/06/21		TLM1	
13.	Diagonalization of a Matrix	1	8/06/21		TLM1	
14.	Orthogonal reduction of real symmetric matrices	1	9/06/21		TLM1	
15.	Reduction of quadratic form to canonical form	1	10/06/21		TLM1	
16.	Reduction of quadratic form to canonical form-Rank-Positive, Negative	1	11/06/21		TLM1	
17.	Definite-Semi definite-Index, Signature	1	12/06/21		TLM1	
18.	Definite-Semi definite-Index, Signature	1	15/06/21		TLM1	
19.	Assignment/Quiz Unit-III	1	16/06/21		TLM6	
20.	Tutorial-6	1	17/06/21		TLM3	
No. of classes required to complete Unit-III:			13	No. of classes taken:		

### UNIT-IV: Solution of Algebraic and Transcendental equations & Interpolation and finite Differences

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Introduction to Unit IV	1	18/06/21		TLM1	
9.	False Position method	1	19/06/21		TLM1	
10.	Newton- Raphson Method in one variable	1	22/06/21		TLM1	
11.	Tutorial-7	1	23/06/21		TLM3	

12.	Introduction – Finite differences	1	24/06/21		TLM1
13.	Forward Differences- Backward differences –Central differences	1	25/06/21		TLM1
14.	Forward Differences- Backward differences –Central differences	1	26/06/21		TLM1
15.	Symbolic relations and separation of symbols	1	29/06/21		TLM1
16.	Tutorial-8	1	30/06/21		TLM3
17.	Newton’s formulae for interpolation	1	01/07/21		TLM1
18.	Lagrange’s Interpolation	2	02/07/21 03/07/21		TLM1
19.	Assignment/Quiz Unit-IV	1	06/07/21		TLM6
No. of classes required to complete Unit-IV:			13	No. of classes taken:	

### UNIT-V : Numerical Solution of Linear System of Equations& Curve Fitting

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Introduction to UNIT V	1	07/07/21			
11.	Gauss –Seidal method	2	08/07/21 09/07/21			
12.	Gauss Jacobi Method	2	10/07/21 13/07/21			
13.	Determination of EIGEN values by iteration.	1	14/07/21			
14.	Fitting of a Straight line	1	15/07/21			
15.	Tutorial-9	1	16/07/21			
16.	Fitting of a second degree polynomial	1	17/07/21			
17.	Fitting of exponential curves	1	20/07/21			
18.	Fitting of a power curve	1	21/07/21			
19.	Assignment/Quiz UNIT-V	1	22/07/21			
20.	Tutorial-10	1	23/07/21			
No. of classes required to complete UNIT-V:			13	No. of classes taken:		

### Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Solving System of Equations using other methods	1	24/07/21			
No. of classes required to complete UNIT-V:				No. of classes taken:		

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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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.
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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.

Course Instructor  
(G.Vijaya Lakshmi)

Course Coordinator  
(Dr. K. R. Kavitha)

Module Coordinator  
(Dr. A. Rami Reddy)

HOD  
(Dr. A. Rami Reddy)



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## COURSE HANDOUT

### PART-A

Name of Course Instructor : G V Suresh  
Course Name & Code : Design and Analysis of Algorithms- 17CI08  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-21

**PRE-REQUISITE:** : Basic of Programming language and Data structure

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

Students undergoing this course are expected to:

Explain the fundamental concepts of various algorithm design techniques. Make the students familiar to conduct performance evaluation of algorithms. Expertise the students with the various existing algorithm design techniques. Motivate the students to design a new algorithm for various problems and introduce the concepts of P&NP-class problems.

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

CO 1	Identify the basic properties and analysis methods of algorithms and design divide and conquer paradigm for solving a few example problems and analyze them.
CO 2	Design Greedy algorithms for knapsack problem, minimum cost spanning tree, single source shortest path problem and analyze them.
CO 3	Apply dynamic programming paradigm to solve travelling sales person problem, 0/1 knapsack problem, Optimal binary search tree.
CO 4	Apply Backtracking search methods on state space trees for few example problems
CO 5	Analyze branch and bound search methods through problems such as 0/1 knapsack problem, Travelling salesperson problem.

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

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

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

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

#### **TEXTBOOKS:**

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

Galgotia Publications.

T2: Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson, 2007.

#### REFERENCE BOOKS

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

#### PART-B

#### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT -I: INTRODUCTION

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to course	1	12.04.2021		TLM1	
24.	Algorithm definition and Specifications	1	17.04.2021		TLM1	
25.	Performance Analysis	1	19.04.2021		TLM1	
26.	Time Complexity and space complexity	1	24.04.2021		TLM1	
27.	Asymptotic Notations- Big-Oh, Omega and Theta	1	26.04.2021		TLM1 /TLM2	
28.	Divide & Conquer Technique: General Method	1	28.04.2021		TLM1 /TLM2	
29.	Binary Search and its analysis	1	01.05.2021		TLM1 /TLM2	
30.	Finding Maximum and Minimum and its Analysis	1	03.05.2021		TLM1 /TLM2	
31.	Merge sort and its Analysis	1	05.05.2021		TLM1 /TLM2	
32.	Quick Sort algorithm and its analysis	1	08.05.2021		TLM1 /TLM2	
33.	Assignment 1/Tutorial-1	1	10.05.2021		TLM 3	
No. of classes required to complete UNIT-I : <b>11</b>				No. of classes taken:		

**UNIT –II: Greedy Method**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion (DD-MM-YY)	Actual Date of Completion (DD-MM-YY)	Teaching Learning Methods	HOD Sign Weekly
34.	Greedy Method – Introduction, General method	1	12.05.2021		TLM1/ TLM2	
35.	Knapsack problem , Example problem	1	15.05.2021		TLM1 /TLM2	
36.	Job sequencing with deadlines, Example problem	1	17.05.2021		TLM1 /TLM2	
37.	Minimum cost spanning trees, example problem	1	19.05.2021		TLM1 /TLM2	
38.	Optimal storage on tapes, Example problem	1	22.05.2021		TLM1 /TLM2	
39.	Optimal Merge patterns, Example problem	1	31.05.2021		TLM1 /TLM4	
40.	Single source Shortest path problem	1	02.06.2021		TLM1 /TLM2	
41.	Assignment-2/Tutorial-2	1	05.06.2021		TLM 3	
No. of classes required to complete <b>UNIT-2 : 08</b>				No. of classes taken:		

**UNIT –III: DYNAMIC PROGRAMMING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Dynamic Programming- General method	1	07.06.2021		TLM1	
43.	Multistage Graph, Example problem	1	09.06.2021		TLM1 /TLM2	
44.	All pairs Shortest path, Example problem	1	12.06.2021		TLM1 /TLM2	
45.	Optimal Binary Search Tree , Example problem	1	14.06.2021		TLM1 /TLM2	
46.	0/1 Knapsack Problem	1	16.06.2021		TLM1 /TLM2	
47.	Travelling Salesperson Problem	1	19.06.2021		TLM1	
48.	Single source shortest path problem, Example Problem	1	21.06.2021		TLM1	
49.	Reliability design, Example Problem	1	23.06.2021		TLM1	
50.	Tutorial-3/ Assignment-3	1	23.06.2021		TLM 3	
No. of classes required to complete <b>UNIT-3 : 09</b>				No. of classes taken:		



**UNIT –IV: BACK TRACKING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
51.	General Method	1	26.06.2021		TLM1	
52.	The 8-Queens problem	2	28.06.2021		TLM1 /TLM2	
53.	Sum of subsets problem	2	30.06.2021		TLM1 /TLM2	
54.	Graph coloring problem	1	03.07.2021		TLM1 /TLM2	
55.	Hamiltonian cycles	1	05.07.2021		TLM1 /TLM2	
56.	Tutorial-4/Assignment-4	1	05.07.2021		TLM 3	
No. of classes required to complete <b>UNIT-4 : 08</b>						

**UNIT-V: NP- HARD AND NP-COMPLETE 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
57.	Branch and Bound-General method	1	07.07.2021		TLM1	
58.	LC Branch and bound solution for Travelling Sales Person Problem	1	10.07.2021		TLM1 /TLM2	
59.	LC Branch and bound solution 0/1 Knapsack problem	2	12.07.2021		TLM1 /TLM2	
60.	FIFO Branch and bound solution for Travelling Sales Person Problem	2	14.07.2021		TLM1 /TLM2	
61.	FIFO Branch and bound solution 0/1 Knapsack problem	1	17.07.2021		TLM1 /TLM2	
62.	Assignment-5 /Tutorial-5	1	19.07.2021		TLM 3	
No. of classes required to complete <b>UNIT-5 : 08</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 (R17 Regulations):**

Evaluation Task	Marks
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Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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>	<b>Programming Paradigms:</b> To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to Analyze, Design and implement data driven applications into the students.
<b>PSO 3</b>	<b>Software Engineering:</b> Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Course Instructor  
G.V.Suresh

Course Coordinator  
Mr. G.V.Suresh

Module Coordinator  
Dr. D. Veeraiah

HOD  
Dr. D. Veeraiah



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## COURSE HANDOUT

### PART-A

Name of Course Instructor : G BALU NARASIMHARAO  
Course Name & Code : Linux Programming & 17CS01  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-21  
PRE-REQUISITE : Knowledge in Operating Systems

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** Introduce the student to Linux kernel programming techniques. Review basic concepts covered in the core Operating Systems course prerequisite as they are realized in the Linux platform. Discuss the Process, Inter-Process Communication Techniques and Network Implementation in Linux.

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

CO 1	Explore LINUX Ecosystem.
CO 2	Implement Shell scripting in LINUX Kernel.
CO 3	Design AWK scripts for text processing and Apply Regular Expressions for Pattern Matching.
CO 4	Design Scripts for Process Creation & Network Management.
CO5	Analyze multi-processing in Linux kernel.

**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		1	1	-	-	-	-	-	-	-	1	3	-	-
CO2	2	2	3	1	-	-	-	-	-	-	-	1	3	-	-
CO3	3	2	3	1	-	-	-	-	-	-	-	1	3	-	-
CO4	2	2	3	-	-	-	-	-	-	-	-	1	3	-	-
CO5	2	2	1	1	-	-	-	-	-	-	-	1	3	-	-

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

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

**TEXT BOOKS:**

- T1** Sumitabha Das., “Your Unix The Ultimate Guide”, TMH Publications, 2001.
- T2** M.G. Venkatesh Murthy, “Introduction to UNIX & SHELL programming”, Pearson Education, First Edition, New Delhi, 2009.

**REFERENCE BOOKS:**

- R1** B.A. Forouzan & R.F. Giberg, “Unix and shell Programming”, Thomson, First Edition, New Delhi, 2003.
- R2** E. Foster – Johnson & others, “Beginning shell scripting”, John Wiley & sons, First Edition, New Delhi, 2008.
- R3** Sumitabha Das, “Unix concepts and applications”, TMH Publications, 4<sup>th</sup> Edition,.
- R4** Gaham Glass & K. Ables, Unix for programmers and users, pearson education, 3<sup>rd</sup> edition,.

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
63.	Operating systems Concepts	1	13-4-21			
64.	Introduction to LINUX	1	15-4-21			
65.	Features of Linux kernel and shell	1	16-4-21			
66.	Linux KERNEL, Terminal, Shell	1	20-4-21			
67.	Linux Commands	1	22-4-21			
68.	Linux Commands	1	23-4-21			
69.	Linux Commands	2	27-4-21 29-4-21			
No. of classes required to complete UNIT-I: <b>8</b>				No. of classes taken:		

**UNIT-II: Introduction to Shell and Shell programming**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Shell	1	30-4-21		TLM1 TLM2	
22.	Shell commands	2	4-5-21 6-5-21		TLM1 TLM2	
23.	Shell programming (VI editor)	3	7-5-21 11-5-21 13-5-21		TLM1 TLM2	
24.	Shell Meta characters, Variables, Commands	2	14-5-21 18-5-21		TLM1 TLM2	
25.	Control structures, shell script examples	2	20-5-21 1-6-21		TLM1 TLM2	
No. of classes required to complete UNIT-II: <b>10</b>				No. of classes taken:		
<b>I MID EXAMINATIONS FROM 24-5-2021 TO 31-5-2021</b>						

**UNIT-III: Filters, regular expressions and Programming with AWK**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Filters and commands: pr, cmp, comm, ulink, diff, head, tail	1	3-6-21			
22.	Introduction to Filters and commands: find, cut, paste, sort, uniq, tr, w, finger	1	4-6-21			
23.	Regular expression: grep, egrep, fgrep, sed	2	8-6-21 10-6-21			
24.	Line addressing, context addressing	1	11-6-21			
25.	Text substitution	1	15-6-21			
26.	Programming with AWK: Awk statements, variables and expressions	2	17-6-21 18-6-21			
27.	Comparison and logical operators, Begin and end sections	1	22-6-21			
28.	Decision and looping statements	1	24-6-21			
No. of classes required to complete UNIT-III: <b>10</b>				No. of classes taken:		

**UNIT-IV : Linux internals and networking**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Linux process concept	1	25-6-21		TLM1 TLM2	
21.	Process creation mechanism, process attributes	1	29-6-21		TLM1 TLM2	
22.	Linux Internal: Kernal structure, system calls	1	1-7-21		TLM1 TLM2	
23.	Signals, Memory Management	1	2-7-21		TLM1 TLM2	
24.	Network Implementation: TCP-Sockets, connect, Listen	1	6-7-21		TLM1 TLM2	
25.	Read, write, accept, fork	1	8-7-21		TLM1 TLM2	
26.	UDP-sockets, sendto, recvfrom functions	2	9-7-21		TLM1 TLM2	
No. of classes required to complete UNIT-IV: <b>8</b>				No. of classes taken:		

**UNIT-V: Multi-Processing**

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.	Intel multi processor specification	1	13-7-21		TLM1 TLM2	
22.	Problems with multi-processor systems	2	15-7-21 16-7-21		TLM1 TLM2	
23.	Changes to the kernel	2	20-7-21 21-7-21		TLM1 TLM2	
24.	compiling LINUX SMP	2	22-7-21 23-7-21		TLM1 TLM2	
No. of classes required to complete UNIT-V: 7				No. of classes taken:		
<b>II MID EXAMINATIONS 25-7-2021 TO 31-07-2021</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 (R17 Regulations):**

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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.
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<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 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.
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<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.
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<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>	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
<b>PSO 2</b>	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
<b>PSO 3</b>	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.





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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

<b>Name of Course Instructor</b>	: Dr. M. SITHA RAM	
<b>Course Name &amp; Code</b>	: Database Management Systems-17CI09	
<b>L-T-P Structure</b>	: 2-2-0	Credits : 3
<b>Program/Sem/Sec</b>	: B.Tech., CSE, IV-Sem., Section – C	A.Y : 2020 - 2021

#### PRE-REQUISITE:

Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

#### COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course enables the students to know about Basic concepts of DBMS, Database Languages, Database Design, Normalization Process, Transaction Processing, and Indexing.

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

<b>CO1</b>	<b>Outline</b> the components of DBMS & design database using ER model
<b>CO2</b>	<b>Construct</b> database using SQL and extract data from database using Relational algebra & SQL queries.
<b>CO3</b>	<b>Apply</b> the normalization process for effective database design
<b>CO4</b>	<b>Analyze</b> components of transaction processing, Concurrency control mechanisms and recovery strategies of DBMS
<b>CO5</b>	<b>Evaluate</b> different File organization & Indexing Techniques

#### 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>	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
<b>CO2</b>	3	3	-	-	1	-	-	-	-	-	-	-	2	3	-
<b>CO3</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	3	-
<b>CO4</b>	2	1	2	-	-	-	-	-	-	-	-	-	1	3	-
<b>CO5</b>	2	1	2	-	-	-	-	-	-	-	-	-	1	3	-

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

1- Low

2 –Medium

3 High

**TEXT BOOKS:**

- T1** Henry F. Korth, Abraham Silberschatz, S.Sudarshan, “Database System Concepts”, McGraw Hill, 6 th edition, 2009.
- T2** Ramez Elmasri, Shamkanth B.Navathe, “Fundamentals of Database Systems”, Addison Wesley, 6 th edition, 2010.

**REFERENCE BOOKS:**

- R1** Raghu Ramakrishnan, Johannes Gehrke, “Database Management System”, McGraw Hill, 3 rd edition, 2000.
- R2** Date C J, “An Introduction to Database System”, Pearson Education, 8th edition, 2003
- R3** Sharad Maheshwari, Ruchin Jain, “DBMS: Complete Practical Approach”, Firewall Media, New Delhi, 2005
- R1** Raghu Ramakrishnan, Johannes Gehrke, “Database Management System”, McGraw Hill, 3 rd edition, 2000.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT –I: Introduction & Data modeling 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
70.	Introduction, An overview of database management system	1	12-04-2021			
71.	Database system Vs file system	1	15-04-2021			
72.	Database system concepts and architecture	1	16-04-2021			
73.	Data models schema and instances	1	17-04-2021			
74.	Data independence and data base language and interfaces	1	19-04-2021			
75.	Data definitions language, DML, Overall Database Structure	1	22-04-2021			
76.	ER model concepts-notation for ER diagram	1	23-04-2021			
77.	Mapping constraints, keys	1	24-04-2021			
78.	Concepts of Super Key, candidate key, primary key, Generalization, aggregation	1	26-04-2021			
79.	Reduction of an ER diagrams to tables, Extended ER model, Relationships of higher	1	29-04-2021			

	degree				
80.	Unit review and Discussion	1	30-04-2021		
81.	Assignment – 1	1	01-05-2021		
No. of classes required to complete UNIT-I		13			

### 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
82.	Relational data model concepts	1	03-05-2021			
83.	Integrity constraints: entity integrity, referential integrity	1	06-05-2021			
84.	Keys constraints, Domain constraints	1	07-05-2021			
85.	Relational algebra	1	08-05-2021			
86.	Characteristics of SQL, Advantage of SQL	1	10-05-2021			
87.	SQL data types and literals, Types of SQL commands	1	13-05-2021			
88.	SQL operators and their procedure	1	15-05-2021			
89.	Tables, views and indexes,	1	17-05-2021			
90.	Queries and sub queries, Aggregate functions	1	20-05-2021			
91.	Insert, update and delete operations	1	21-05-2021			
92.	Unions, Intersection, Minus, Cursors in SQL	1	22-05-2021			
93.	Unit Overview and Discussion	1	31-05-2021			
94.	Assignment - 2	1	03-06-2021			
No. of classes required to complete UNIT-II		12				

### 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
95.	Functional Dependencies, First Normal Form	1	04-06-2021			
96.	Second, Third Normal Forms	1	05-06-2021			
97.	BCNF, Inclusion Dependences	1	07-06-2021			
98.	Loss Less Join Decompositions	1	10-06-2021			
99.	Normalization Using FD, MVD, JD	1	11-06-2021			

100.	Alternative Approaches To Database Design	1	12-06-2021			
101.	Unit Overview and Discussion	1	14-06-2021			
102.	Assignment - 3	1	17-06-2021			
No. of classes required to complete UNIT-III		10				

#### UNIT –IV: Transaction Processing Concepts & Concurrency Control 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
103.	Transaction System	1	18-06-2021			
104.	Testing Of Serializability	1	19-06-2021			
105.	Serializability Of Schedules	1	21-06-2021			
106.	Conflict & View Serializable Schedule	1	24-06-2021			
107.	Recoverability, Log Based Recovery, Checkpoints,	1	25-06-2021			
108.	ARIES Algorithm, Deadlock Handling	1	26-06-2021			
109.	Concurrency Control	1	28-06-2021			
110.	Techniques For Concurrency Control	1	01-07-2021			
111.	Time Stamping Protocols For Concurrency Control	1	02-07-2021			
112.	Locking, Validation Based Protocol	1	03-07-2021			
113.	Multiple Granularity	1	05-07-2021			
114.	Recovery With Concurrent Transactions	1	08-07-2021			
115.	Unit Overview and Discussion	1	09-07-2021			
116.	Assignment - 4	1	10-07-2021			
No. of classes required to complete UNIT-IV		14				

#### UNIT-V: Storage and Indexing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
117.	RAID Levels	1	12-07-2021			
118.	Page, Record Formats	1	15-07-2021			
119.	File Types And Organization, Tutorial – IX	1	16-07-2021			
120.	ISAM	1	17-07-2021			
121.	B-Tree	1	19-07-2021			
122.	B+-Tree	1	22-07-2021			
123.	RAID Levels	1	23-07-2021			
124.	Unit Overview and	1	24-07-2021			

	Discussion				
125.	Assignment - 4	1	24-07-2021		
No. of classes required to complete UNIT-V		09		No. of classes taken:	

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 (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks = 75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

### PART-D

#### PROGRAMME OUTCOMES (POs):

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. M. SITHA RAM	Dr. CH. V. Narayana	DR. D. JAGAN MOHAN REDDY	DR. D. VEERAI AH



# 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.

<http://cse.lbrce.ac.in>, [cselbreddy@gmail.com](mailto:cselbreddy@gmail.com), Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

<b>PROGRAM</b>	: B.Tech. IV-Sem., CSE
<b>ACADEMIC YEAR</b>	: 2020-21
<b>COURSE NAME &amp; CODE</b>	: SOFTWARE ENGINEERING & 17CI10
<b>L-T-P STRUCTURE</b>	: 3-0-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: CH. SRINIVASA RAO
<b>COURSE COORDINATOR</b>	: Dr. P. ASHOK REDDY

1. **Pre-requisites:** Concepts of programming and Database Management Systems.

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

An understanding of different software processes and how to choose between them. How to understand requirements from a client and specify them. Design in the large, including principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns. Knowing various quality assurance techniques, including unit testing, integration testing and functional testing.

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

**S381.1: Understand the fundamentals of software engineering concepts and software process standards**

**S381.2: Demonstrate appropriate process models and software engineering practices**

**S381.3: Analyze requirements of software system and explore all requirements gathering approaches**

**S381.4: Create an architectural design using standard design processes**

**S381.5: Apply software testing strategies and tactics for testing real time projects effectively**

#### 4. Course Articulation Matrix:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
S381.1	1	3	1	-	-	1	-	-	-	-	1	1	-	-	3
S381.2	1	3	2	-	-	1	-	1	-	-	-	-	-	-	3
S381.3	1	3	2	-	1	1	1	1	1	1	-	-	-	1	3
S381.4	2	3	3	-	1	1	1	1	-	-	-	1	-	-	3
S381.5	1	3	3	-	1	1	-	1	-	-	1	1	2	-	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 BOOK:

- Roger S. Pressman, Software Engineering – A Practitioner’s Approach, Mc. Graw-Hill International Edition, 6<sup>th</sup> Edition, 2005.

#### REFERENCES:

1. Ian Sommerville, “Software Engineering”, Pearson Education, 8<sup>th</sup> Edition, 2008.
2. Ali Behforooz and Frederick J. Hudson, “Software Engineering Fundamentals”, Oxford University Press, New Delhi, 1996.
3. Stephan Schach, “Software Engineering”, Tata Mc. Graw-Hill, 2007.
4. Pfleeger and Lawrence, “Software Engineering: Theory and Practice”, Pearson Education, Second Edition, 2001, 1995, PHI.

#### Web link:

[http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman\\_\\_Software\\_Engineering.pdf](http://www.resource.mitfiles.com/IT/II%20year/IV%20sem/Software%20Engineering/books/Pressman__Software_Engineering.pdf)



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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
126.	Introduction to Software Engineering & Evolving role of Software	1	12/04/2021	12/04/2021	TLM2	CO1	T1	
127.	Software Definition and Characteristics & Changing nature of Software	1	17/04/2021	17/04/2021	TLM2	CO1	T1	
128.	Legacy Software and Its Quality	1	19/04/2021	19/04/2021	TLM2	CO1	T1	
129.	Software Myths	1	24/04/2021	24/04/2021	TLM2	CO1	T1	
130.	Software Process: Definition and Differences & Software Engineering – A layered technology	1	26/04/2021	26/04/2021	TLM2	CO1	T1,R1	
131.	Process Framework – Generic Framework Activities & Umbrella Activities	1	28/04/2021	28/04/2021	TLM2	CO1	T1,R1	
132.	CMMI Model	1	01/05/2021	01/05/2021	TLM2	CO1	T1,R1	
133.	Process Patterns & Process Assessment and Approaches	1	03/05/2021	03/05/2021	TLM2	CO1	T1,R1	
134.	Software Process Models, Process Technology & Product and Process	1	05/05/2021	05/05/2021	TLM2	CO1	T1	
135.	<b>TUTORIAL-1</b>	1	05/05/2021	05/05/2021	TLM3	CO1	T1	
No. of classes required to complete UNIT-I		<b>10</b>			No. of classes taken:			

**UNIT -II:**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
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136	Process Models: Prescriptive Models & Waterfall Model	1	08/05/2021	08/05/2021	<b>TLM2</b>	CO2	T1
137	Incremental Model & RAD Model	1	10/05/2021	10/05/2021	<b>TLM2</b>	CO2	T1
138	Evolutionary Process Models	1	12/05/2021	12/05/2021	<b>TLM2</b>	CO2	T1
139	Specialized Process Models & Unified Process	1	15/05/2021	15/05/2021	<b>TLM2</b>	CO2	T1
140	Software Engineering Practices: Communication Practices	1	17/05/2021	17/05/2021	<b>TLM2</b>		T1
141	Planning Practices, Modeling Practice & Construction Practice & Deployment	1	19/05/2021	19/05/2021	<b>TLM2</b>	CO2	T1,R1
142	<b>TUTORIAL-2</b>	1	19/05/2021	19/05/2021	<b>TLM3</b>	CO2	T1
No. of classes required to complete UNIT-2		<b>7</b>			No. of classes taken:		

### UNIT –III:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
143	Requirements Engineering: Description, RE Tasks	1	22/05/2021	22/05/2021	<b>TLM2</b>	CO3	T1	
144	Initiating the RE Process	1	31/05/2021	31/05/2021	<b>TLM2</b>	CO3	T1	
145	Eliciting Requirements , Developing Use-Cases	1	02/06/2021	02/06/2021	<b>TLM2</b>	CO3	T1	
146	Building the Analysis Models	1	05/06/2021	05/06/2021	<b>TLM2</b>	CO3	T1,R1	
147	Negotiating and Validating Requirements	1	07/06/2021	07/06/2021	<b>TLM2</b>	CO3	T1,R1	
148	Building the Analysis Model: Requirements Analysis	1	09/06/2021	09/06/2021	<b>TLM2</b>		T1,R1	
149	Analysis Modeling Approaches & Data Modeling Concepts	1	12/06/2021	12/06/2021	<b>TLM2</b>	CO3	T1	
150	Object Oriented Analysis, Scenario Based Modeling	1	14/06/2021	14/06/2021	<b>TLM2</b>	CO3	T1	
151	Flow Oriented Modeling, Class Based Modeling,	1	16/06/2021	16/06/2021	<b>TLM2</b>	CO3	T1	

	Creating a Behavioral Model							
152	<b>TUTORIAL -3</b>	1	16/06/2021	16/06/2021	<b>TLM3</b>	CO3	T1	
No. of classes required to complete <b>UNIT-3</b>		<b>10</b>			No. of classes taken:			

#### UNIT -IV:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
153	Design Engineering: Design within context of Software Engineering	1	19/06/2021	19/06/2021	<b>TLM2</b>	CO4	T1	
154	Design Process and Design Quality	1	21/06/2021	21/06/2021	<b>TLM2</b>	CO4	T1	
155	Design Concepts	1	23/06/2021	23/06/2021	<b>TLM2</b>	CO4	T1	
156	Design Model	1	26/06/2021	26/06/2021	<b>TLM2</b>	CO4	T1,R1	
157	Pattern Based Software Design	1	28/06/2021	28/06/2021	<b>TLM2</b>	CO4	T1,R1	
158	Software Architecture and Data Design	1	30/06/2021	30/06/2021	<b>TLM2</b>	CO4	T1	
159	Architectural Styles and Patterns, Architectural Design	1	03/07/2021	03/07/2021	<b>TLM2</b>	CO4	T1	
160	<b>TUTORIAL -4</b>	1	03/07/2021	03/07/2021	<b>TLM3</b>	CO4	T1,R1	
No. of classes required to complete <b>UNIT-4</b>		<b>8</b>			No. of classes taken:			

#### UNIT-V:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
161	A Strategic Approach to Software Testing & Strategic	1	05/07/2021	05/07/2021	<b>TLM2</b>	CO5	T1	

	Issues							
162	Test Strategies for Conventional Software	1	07/07/2021	07/07/2021	<b>TLM2</b>	CO5	T1	
163	Test Strategies for Object Oriented Software	1	10/07/2021	10/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
164	Validation Testing & System Testing, The art of Debugging	1	12/07/2021	12/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
165	Software Testing Fundamentals	1	14/07/2021	14/07/2021	<b>TLM2</b>	CO5	T1	
166	White Box Testing & Basis Path Testing	1	17/07/2021	17/07/2021	<b>TLM2</b>	CO5	T1	
167	Control Structure and Black Box Testing	1	19/07/2021	19/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
168	OO- Testing Methods	1	24/07/2021	24/07/2021	<b>TLM2</b>	CO5	T1,R1,R2	
169	<b>TUTORIAL -5</b>		24/07/2021	24/07/2021	<b>TLM3</b>	CO5	T1,R1,R2	
No. of classes required to complete <b>UNIT-5</b>		<b>8</b>			No. of classes taken:			

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

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

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

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

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

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

## **PROGRAMME OUTCOMES (POs):**

### **Engineering Graduates will be able to:**

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

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

## **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

### **1. Programming Paradigms:**

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

### **2. Data Engineering:**

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

### **3. Software Engineering:**

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

**Course Instructor**

**Course Coordinator**

**Module Coordinator**

**HOD**



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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr D.Venkateswarlu  
Course Name & Code : Professional Ethics & Human Values  
L-T-P Structure : 3-0-0 Credits : 0  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-21

#### **PRE-REQUISITE: ETHICS & VALUES**

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

- ❖ To create an awareness on engineering ethics and human values.
- ❖ To give an impetus on achieving higher positions in profession, with ethical and human values as a base and support for the growth.
- ❖ To make the student realize the sensitiveness associated with experimentation process
- ❖ To adumbrate the inevitability of different intellectual property rights like patents, copyrights, trademarks, and trade secret.
- ❖ To explicate the professional and societal responsibilities of the engineers.

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

CO 1	Implement the basic concepts of Professional Ethics in real time decision making process
CO 2	Absorbs the basic concepts of Human values to gain the connotations of ethical theories
CO 3	Recognizes the duties and responsibilities towards the society in an engineering profession
CO 4	Undertakes necessary precautions while conducting the experiments which may reduce the risk
CO 5	Realizes the importance of ethical aspects in globalization

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

CO's / PO's	R17-Professional Ethics & Human Values-S355											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1								3				
CO2			1					3				
CO3		1	2					3	2			
CO4				1		2		3	1			
CO5						1	2	3				1
<b>3 = High (100%)   2= Moderate (70%)   1= Slight (Low) (40%)</b>												

**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** R.S.Nagarajan, a Textbook on “Professional Ethics and Human Values”, New Age Publishers – 2006.
- T2** Mike Martin and Roland Schinzinger, "Ethics in engineering", McGraw Hill, New York 1996.

**BOS APPROVED REFERENCE BOOKS:**

- R1** Govindarajan M, Natarajan S, Senthil Kumar V. S, “ Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.
- R2** Charles D. Fleddermann, "Engineering Ethics", Pearson Education/ Prentice Hall, New Jersey,2004 ( Indian Reprint now available )



## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Engineering Ethics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
170.	Introduction to Course and COs	1	12-04-21		TLM1/2	
171.	Introduction to Unit-I	1	15-04-21		TLM1/2	
172.	UNIT-I Introduction about engineering ethics	1	17-04-21		TLM1/2	
173.	Senses of engineering ethics, Variety of moral issues	1	19-04-21		TLM1/2	
174.	Moral dilemmas moral autonomy	1	22-04-21		TLM1/2	
175.	Kohlberg's theory	1	24-04-21		TLM1/2	
176.	Gilligan theory, Consensus and controversy	1	26-04-21		TLM1/2	
177.	Models of professional roles about right action, self interest	1	29-04-21		TLM1/2	
178.	Customs and religion, uses of ethical theories	1	03-05-21		TLM1/2	
179.	Uses of ethical theories	1	06-05-21		TLM1/2	
180.	Assignment-1				TLM3	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

#### UNIT-II: Human Values

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Introduction about values	1	08-05-21		TLM1/2	
27.	Morals ethics and values, Integrity	1	10-05-21		TLM1/2	
28.	Work ethic, Service learning, Civic virtue	1	13-05-21		TLM1/2	
29.	Respect for others, living peacefully, Caring, sharing,	1	15-05-21		TLM1/2	
30.	Honesty, courage, Valuing time, cooperation	1	17-05-21		TLM1/2	
31.	Commitment, Empathy, self confidence	1	20-05-21		TLM1/2	
32.	Character, spirituality	1	22-05-21		TLM1/2	
33.	Assignment-2				TLM3	
No. of classes required to complete UNIT-II: 7				No. of classes taken:		
IST MID EXAMS : 24-05-21 to 29-05-21						

**UNIT-III: Engineering as Social Experimentation**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	Engineering as experimentation introduction	1	31-05-21		TLM1/2	
30.	Engineering Projects VS. Standard Experiments	1	03-06-21		TLM1/2	
31.	Engineers as responsible experimenters	1	05-06-21		TLM1/2	
32.	Codes of ethics, Industrial Standards	1	07-06-21		TLM1/2	
33.	A balanced outlook on law	1	10-06-21		TLM1/2	
34.	The challenger case study	1	12-06-21		TLM2	
35.	Assignment-3				TLM3	
No. of classes required to complete UNIT-III: 6				No. of classes taken:		

**UNIT-IV: Safety, Responsibilities and Rights**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Introduction about Safety, and rights	1	14-06-21		TLM1/2	
28.	Assessment of safety and risk	1	17-06-21		TLM1/2	
29.	Risk benefit analysis and reducing risk ,Three Mile Island and Chernobyl case study	1	19-06-21		TLM1/2	
30.	Collegiality and loyalty, Respect for authority,	1	21-06-21		TLM1/2	
31.	Collective bargaining-Confidentiality	1	24-06-21		TLM1/2	
32.	Conflicts of interest, Occupational crime	1	26-06-21		TLM1/2	
33.	Professional Rights, Employee rights	1	28-06-21		TLM1/2	
34.	Intellectual Property Rights (IPR)	1	01-07-21		TLM1/2	
35.	Assignment-4				TLM3	
No. of classes required to complete UNIT-IV: 8				No. of classes taken:		

**UNIT-V: Global Issues**

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.	MNC's, Morality in MNC's	1	03-07-21		TLM1/2	
26.	Environmental Ethics	1	05-07-21		TLM1/2	
27.	Computer ethics.	1	08-07-21		TLM1/2	
28.	Weapons development	1	10-07-21		TLM1/2	
29.	Engineers as managers, consulting engineers	1	12-07-21		TLM1/2	

30.	Engineers as expert witnesses	1	15-07-21		TLM1/2
31.	Engineers as Advisors & Policy Makers	1	17-07-21		TLM1/2
32.	Moral leadership	2	19-07-21&23-07-21		TLM1/2
	Assignment-5				TLM-3
33.	Sample code of Ethics	1	24-07-21		TLM1/2
No. of classes required to complete UNIT-V:10				No. of classes taken:	

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/ Assignment	<b>TLM6</b>	Group Discussion/Project

### **PART-C**

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

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<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.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

<b>PSO 1</b>	<b>Programming paradigms:</b> To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement data driven applications into the students.
<b>PSO 3</b>	<b>Software Engineering:</b> Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products

Sd/-	sd/-	sd/-	sd/-
Course Instructor (Dr.D.Venkateswarlu)	Course Coordinator (Dr.D.Venkateswarlu)	Module Coordinator (Dr.V.V.Narsi Reddy)	HOD (Dr.A.Adishesha Reddy)



# 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.

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

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

Name of Course Instructor : Dr. M. Sitha Ram  
Course Name & Code : Database Management Systems Lab-17CI64  
L-T-P Structure : 0-0-2 Credits : 1  
Program/Sem/Sec : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-21

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

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

CO1	Design & implement a database schema for a given problem-domain.
CO2	Create database using SQL and implement various integrity constraints.
CO3	Apply PL/SQL Programming for problem solving.
CO4	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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

## **Part-B**

### **CYCLE-1**

**1) Create a table STUDENT with appropriate data types and perform the following queries.**

**Roll number, student name, date of birth, branch and year of study.**

1. Insert 5 to 10 rows in a table?
2. List all the students of all branches
3. List student names whose name starts with 's'
4. List student names whose name contains 's' as third literal
5. List student names whose contains two 's' anywhere in the name
6. List students whose branch is NULL
7. List students of CSE & ECE who born after 1980
8. List all students in reverse order of their names
9. Delete students of any branch whose name starts with 's'
10. Update the branch of CSE students to ECE
11. Display student name padded with '\*' after the name of all the students

**2) Create the following tables based on the above Schema Diagram with appropriate data types and constraints and perform the following queries.**

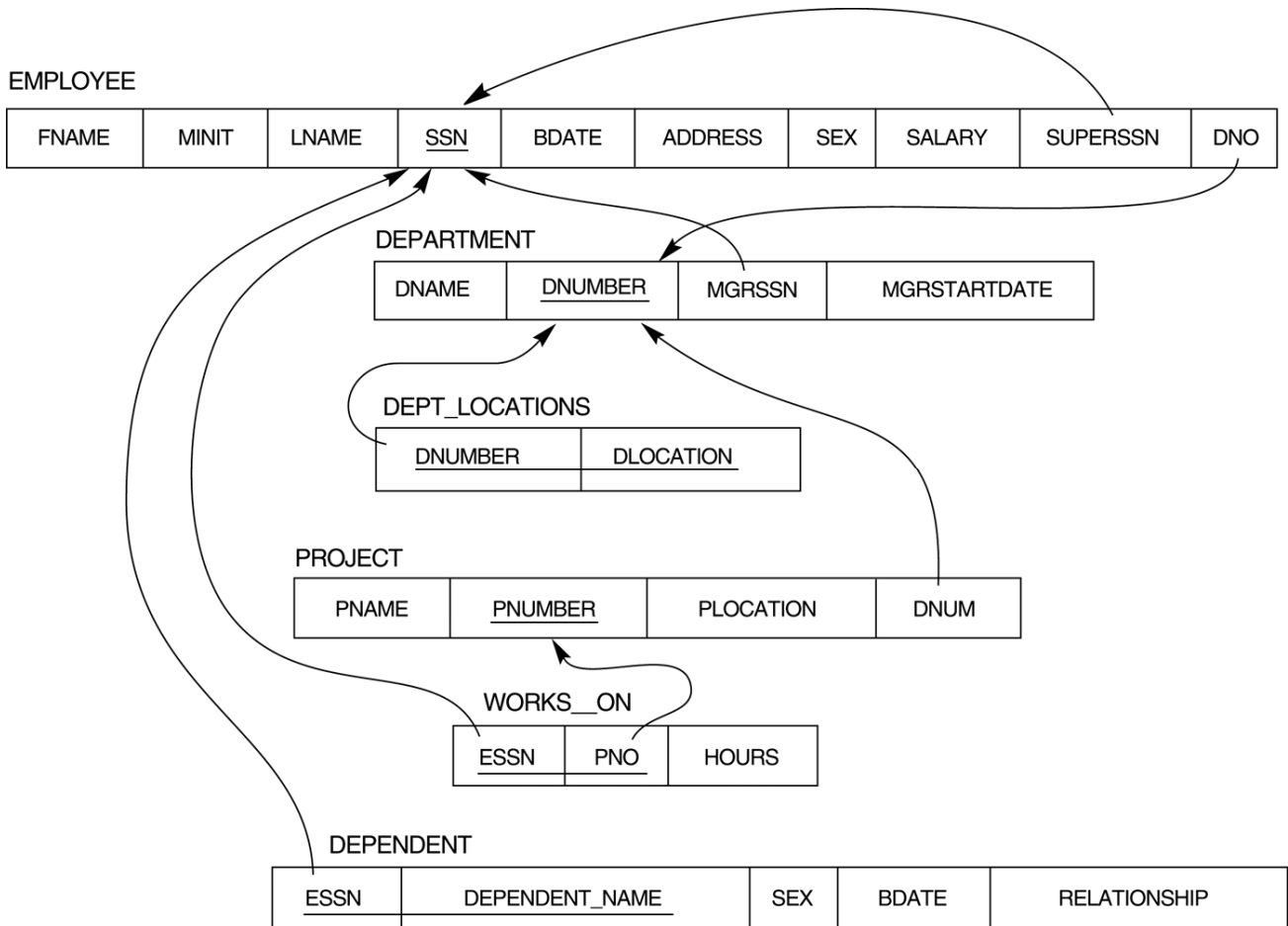
**SAILORS** (Sailid, Salname, Rating, Age)

**RESERVES** (Sailid, boatid, Day)

**BOATS** (Boatid, Boat-name, Color)

1. Insert 5 to 10 rows in all tables?
2. Find the name of sailors who reserved boat number 3.
3. Find the name of sailors who reserved green boat.
4. Find the colors of boats reserved by "Ramesh".
5. Find the names of sailors who have reserved atleast one boat.
6. Find the all sailid of sailors who have a rating of 10 or have reserved boated 104.
7. Find the Sailid's of sailors with age over 20 who have not registered a red boat.
8. Find the names of sailors who have reserved a red or green boat.
9. Find sailors whose rating is better than some sailor called 'Salvador'.
10. Find the names of sailors who are older than the oldest sailor with a rating of 10.

**3) Schema Diagram for the rest of the SQL and PLSQL Programs.**



Create the following tables based on the above Schema Diagram with appropriate data types and constraints.

**EMPLOYEE (Fname, Mname, Lname, SSN, Bdate, Address, Gender, Salary, SuperSSN, Dno)**

**DEPARTMENT(Dnumber, Dname, MgrSSN, Mgrstartdate)**

**DEPENDENT (ESSN, Dependent\_Name, Gender, Bdate, Relationship)**

- 1) Insert 5 to 10 rows into all the tables.
- 2) Display all employee's names along with their department names.
- 3) Display all employee's names along with their dependent details.
- 4) Display name and address of all employees who work for 'ECE' department.
- 5) List the names of all employees with two or more dependents.
- 6) List the names of employee who have no dependents.
- 7) List the names of employees who have at least one dependent.
- 8) List the names of the employees along with names of their supervisors using aliases.
- 9) Display name of the department and name of manager for all the departments.
- 10) Display the name of each employee who has a dependent with the same first name and gender as the employee.
- 11) List the names of managers who have at least one dependent.
- 12) Display the sum of all employees' salaries as well as maximum, minimum and average salary in the entire departments department wise if the department has more than two employees.

- 13) List the departments of each female employee along with her name.
- 14) List all employee names and also the name of the department they manage if they happen to manage a dept.
- 15) Display the name of the employee and his / her supervisor's name.

**4) Create the following tables based on the above Schema Diagram with appropriate data types and constraints in addition to the tables in Experiment 2.**

**DEPT\_LOCATIONS (Dnumber, Dlocation)**

**PROJECT (Pname, Pnumber, Plocation, Dnum)**

**WORKS\_ON(ESSN, Pno, Hours).**

- 1) Insert 5 to 10 rows into all the tables.
- 2) Find the names of the employees who work on all the projects controlled by the department 'ECM'.
- 3) List the project number, name and no. Of employees who work on that project for all the projects.
- 4) List the names of all the projects controlled by the departments department wise.
- 5) Retrieve the names of employees who work on all projects that 'John' works on.
- 6) List the project numbers for projects that involve an employee either as worker or as a manager of the department that controls the project.
- 7) List the names of all employees in one department who work more than 10 hours on one specific project.
- 8) For each project, list the project name and total hours (by all employees) spent on that project.
- 9) Retrieve the names of all employees who work on every project.
- 10) Retrieve the names of all employees who do not work on any project.
- 11) Display the name and total no. of hours worked by an employee who is working on maximum no. of projects among all the employees.
- 12) Display the names of all employees and also no. of hours, project names that they work on if they happen to work on any project(use outer join).
- 13) List the employee name, project name on which they work and the department they belong to for all the employees using alias names for the resulting columns.
- 14) Retrieve the names of all employees who work on more than one project department wise.
- 15) List all the departments that contain at least one occurrence of 'C' in their names.

**5) Create a view that has project name, controlling department name, number of employees**



**and total hours worked on the project for each project with more than one employee working on it.**

- 1) List the projects that are controlled by one department from this view.
- 2) List the managers of the controlling departments for all the projects.
- 3) Demonstrate one update operation on this view.
- 4) List the Location of the controlling departments for all the projects.
- 5) Retrieve the data from the view.

## **PL/SQL LAB CYCLE**

### **CYCLE-II**

6. Write a PL/SQL Block to find whether the number is Armstrong or not.
7. Write a PL/SQL program for generating Fibonacci series
8. Write an anonymous PL/SQL block that fetches and displays the data from employee table to the console.
9. Write a program that updates salaries of all employees with 10 % hike (use cursors).
10. Write a program to fetch salary and employee name from employee table for a given user input.  
When no data found raise an exception that prints the message “no data found”.
11. Write a program to find the number of records of any given table using % ROWCOUNT.
12. Write a cursor to display the list of employees and total salary department wise.
13. Write a database trigger on employee table so that the trigger fires when all the DML statements are executed (print appropriate message).
14. Write a trigger in such a way that it should not allow insert or update or delete on Wednesday and Thursday and display the proper message.
15. Write a procedure to display the name and salary of employee when user inputs SSN using IN/OUT parameters.
16. Write a function to check the validity of the given employee number from the employee table (print the appropriate message using PL/SQL block).
17. Visit TPC and submit report.

## **COURSE DELIVERY PLAN (LESSON PLAN): Section-A**

S.No.	Topics to be covered-/	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	HOD Sign
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		Required	Completion	Completion	Methods	COs	Weekly
1	Introduction to DBMS	2	20-04-2021		TLM8	CO1	
2	<b>CYCLE-I : EXP-1</b>	2	27-04-2021		TLM8	CO1,CO4	
3	EXP-2	2	04-05-2021		TLM8	CO1,CO4	
4	EXP-3	2	11-05-2021		TLM8	CO1,CO4	
5	EXP-4	2	18-05-2021		TLM8	CO1,CO4	
6	EXP-5	2	01-06-2021		TLM8	CO1,CO4	
7	<b>CYCLE-II : EXP-6, EXP7</b>	2	08-06-2021		TLM8	CO1,CO4	
8	EXP-8, EXP9	2	15-06-2021		TLM8	CO2,CO4	
9	EXP-10, EXP11	2	22-06-2021		TLM8	CO2,CO4	
10	EXP-12	2	29-06--2021		TLM8	CO2,CO4	
11	EXP-13	2	06-07-2021		TLM8	CO2,CO4	
12	EXP-14	2	13-07-2021		TLM8	CO3,CO4	
13	EXP-15	2	20-07-2021		TLM8	CO3,CO4	
14	EXP-16, EXP17	2	20-07-2021		TLM8	CO3,CO4	
15	Internal Exam						

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

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

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HOD</b>
<b>Mr. M. SITHA RAM</b>	<b>Mr. M. SITHA RAM</b>	<b>DR. D. JAGAN MOHAN REDDY</b>	<b>DR. D. VEERAI AH</b>



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## COURSE HANDOUT

### PART-A

**Name of Course Instructor** : G BALU NARASIMHA RAO  
**Course Name & Code** : Linux Programming Lab & 17CI61  
**L-T-P Structure** : 2-0-0 Credits : 2  
**Program/Sem/Sec** : B.Tech., CSE., IV-Sem., Sections- C A.Y : 2020-21  
**PRE-REQUISITE** : Knowledge in Operating Systems

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** Introduce the student to Linux kernel programming techniques. Review basic concepts covered in the core Operating Systems course prerequisite as they are realized in the Linux platform. Discuss the Process, Inter-Process Communication Techniques and Network Implementation in Linux.

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

CO 1	Explore LINUX Ecosystem.
CO 2	Implement Shell scripting in LINUX Kernel.
CO 3	Design AWK scripts for text processing and Apply Regular Expressions for Pattern Matching.
CO 4	Design Scripts for Process Creation & Network 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	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).

### TEXT BOOKS:

- T1** Sumitabha Das., “Your Unix The Ultimate Guide”, TMH Publications, 2001.
- T2** M.G. Venkatesh Murthy, “Introduction to UNIX & SHELL programming”, Pearson Education, First Edition, New Delhi, 2009.

**REFERENCE BOOKS:**

- R1** B.A. Forouzan & R.F. Giberg, “Unix and shell Programming”, Thomson, First Edition, New Delhi, 2003.
- R2** E. Foster – Johnson & others, “Beginning shell scripting”, John Wiley & sons, First Edition, New Delhi, 2008.
- R3** Sumitabha Das, “Unix concepts and applications”, TMH Publications, 4<sup>th</sup> Edition,.
- R4** Gaham Glass & K. Ables, Unix for programmers and users, pearson education, 3<sup>rd</sup> edition,.

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

S.No.	Experiments to be covered	No. of sessions Required (1 session 2 hrs)	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
181.	<b>Week1</b> <b>Session-1</b> a)Log into the system b) Use vi editor to create a file called myfile.txt which contains some text. c) Correct typing errors during creation. d)Save the file e)logout of the system <b>Session-2</b> a)Log into the system b)open the file created in session 1 c)Add some text d)Change some text e)Delete some text f)Save the Changes g)Logout of the system	1	28-4-21		<b>TLM4</b>	
182.	<b>Week2</b> a. log in the system b Use the appropriate commands to determine your login shell c. use the / etc/ passwd file to Verify the result of step b. d. use the who command redirect the result to a file called myfile.txt. Use the more command to see the contents of myfile.txt. e) Use the date and who commands in sequence? (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile1.txt. Use the	1	05-5-2021		<b>TLM4</b>	
183.	<b>Week3</b> Log into the system Use the cat command to create a file containing the following data. Call it mytable.txt use tabs to separate the fields	1	12-5-21		<b>TLM4</b>	

	<p>1425 ravi 15.65  4320 ramu 26.27  6830 sita 36.15  1450 raju 21.86</p> <p>a. use the cat command to display the file, mytable.txt  b. use the vi command to correct any errors in the file, mytable.txt  c. use the sort command to sort the file mytable.txt according to the first field. Call the sorted file mytable.txt (same name)  d. print the file mytable.txt  e. use the cut &amp; paste commands to swap fields 2 and 3 my table. Call it mytable.txt (same name)  f. print the new file, mytable.txt  g. logout of the system</p>					
184.	<p><b>Week4</b></p> <p>a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.  b)Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.  c) Write a shell script that determines the period for which a specified user is working on the system.</p>	1	19-5-2021		<b>TLM4</b>	
185.	<p><b>Week5</b></p> <p>Write a shell script that computes the total and average marks of a student according to the following</p> <p>If average marks <math>\geq 69</math> then result is “Distinction”  If average marks <math>\geq 59</math> and <math>\leq 70</math> then result is “First Class”  If average marks <math>\geq 49</math> and <math>\leq 60</math> then result is “Second Class”  If average marks <math>\leq 50</math> then result is “Pass”  Note that any subject marks <math>\leq 40</math> then result is “Fail”  Accept student name and six subject marks through the key board</p>	1	2-06-2021		<b>TLM4</b>	
186.	<p><b>Week6</b></p> <p>a) Write an interactive file handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.  b) Write shell script that takes a</p>	1				

	login name as command – line argument and reports when that person logs in c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.		09-06-2021		
187.	<b>Week7</b> a)Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers. b)Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.	1	16-6-21		<b>TLM4</b>
188.	<b>Week8</b> a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions. b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.	1	23-6-21		<b>TLM4</b>
189.	<b>Week9</b> a) Write a shell script to perform the following string operations: i)To extract a sub-string from a given string. ii)To find the length of a given string. b) Write a awk script to find the number of characters, words and lines in a file.	2	30-6-21		<b>TLM4</b>
190.	<b>Week10</b> Write a C program that takes one or more file or directory names as Command line input and reports the following information on the file: i) File type ii) Number of links iii) Read, write and execute permissions iv) Time of last access (Note : Use stat/fstat system calls)	1	7-7-21		<b>TLM4</b>
191.	<b>Week11</b> Write C programs that simulate the following unix commands: a) mv b) cp c) ls (Use system calls)	1	14-7-21		<b>TLM4</b>
192.	<b>Week12</b>	1	21-7-21		<b>TLM4</b>

	Write a program for bubble sorting using fork system call in linux					
193.	<b>INTERNAL LAB EXAM</b>	-				

<b>Teaching Learning Methods</b>			
<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 (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks = 75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100



## PART-D

### PROGRAMME OUTCOMES (POs):

<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 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>	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
<b>PSO 2</b>	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
<b>PSO 3</b>	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Course Instructor  
(Name)

Course Coordinator  
(Name)

Module Coordinator  
(Name)

HOD  
(Name)



# 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.

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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : A.RAJAGOPAL  
**Course Name & Code** : OOPs through JAVA LAB ( 17CI65 )  
**L-T-P Structure** : 2-0-0 Credits : 2  
**Program/Sem/Sec** : B.Tech., CSE, IV-Sem., Section – C A.Y : 2020 - 2021

#### PRE-REQUISITE: C PROGRAMMING

#### COURSE OBJECTIVE:

Concentrates on the methodological and technical aspects of software design and programming based on OOP. Acquire the basic knowledge and skills necessary to implement object oriented programming techniques in software development through java. Know about the importance of GUI based applications and the development of applications through java.

#### COURSE OUTCOMES (COs)

At the end of the course, the student will be able to:

CO1	Implement and Test the concepts of OOP in program design with a few example exercises.
CO2	Implement and Test the performance of Exception handling, Multithreading concepts with a few examples.
CO3	Implement and Test the performance of GUI based applications using AWT, Swings.
CO4	Improve individual / team work skills, communication & report writing skills with ethical values.

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
194.	Introduction to Java programming	2	16.04.2021		TLM4	
195.	Introduction to Java Compiler	2	23.04.2021		TLM4	
196.	Programs on Basic control structures & Loops	2	30.04.2021		TLM4	
197.	Programs on Basic control structures & Loops	2	07.05.2021		TLM4	
198.	Programs on recursion	2	14.05.2021		TLM4	
199.	Programs on Arrays	2	21.05.2021		TLM4	
200.	Programs on Constructors & Method Overloading	2	04.06.2021		TLM4	
201.	Programs on String & String Buffer classes	2	11.06.2021		TLM4	
202.	Programs on Inheritance , super and final keyword	2	18.06.2021		TLM4	
203.	Programs on Run-Time Polymorphism, Packages and Interfaces	2	25.06.2021		TLM4	
204.	Programs on Exception Handling & Multithreading	2	02.07.2021		TLM4	
205.	Programs on Applets & Event Handling	2	09.07.2021		TLM4	
206.	Programs on Applets & Event Handling	2	16.07.2021		TLM4	
207.	Programs on AWT Components & Layout Managers	2	23.07.2021		TLM4	
208.	Programs on Swings	2	30.07.2021		TLM4	

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

**PROGRAMME OUTCOMES (POs):**

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<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>	<b>Programming Paradigms:</b> The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 2</b>	<b>Data Engineering:</b> To inculcate an ability to analyze, design and implement database applications.
<b>PSO 3</b>	<b>Software Engineering:</b> 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
A.RAJA GOPAL	DR. Y.V.BHASKAR REDDY	DR. D.VEERAI AH	DR. D.VEERAI AH