



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. M.Anuradha

Course Name & Code : PC-II, 20FE02

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

Credits: 02

Program/Sem/Sec : EEE/A/II SEM

A.Y. : 2020-21

PREREQUISITE: NIL

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

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

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

#### UNIT-I

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

#### UNIT-II

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

#### UNIT-III

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

#### UNIT-IV

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

#### UNIT-V

**‘Prafulla Chandra Ray’**; Grammar & Vocabulary: Analogy; Sentence Completion; Writing: Writing a Résumé

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01		1		1		1			3	3		2			
C02		1		1		1			3	3		2			
C03		1		1		1			3	3		2			
C04		1		1		1			3	3		2			
C05		1		1		1			3	3		2			
1 - Low			2 -Medium					3 - High							

**TEXTBOOKS:**

**T1** Prabhavati. Y & etal , “English All Round –Communication Skills for Undergraduate Learners” ,Orient Black Swan, Hyderabad, 2019

**T2** “The Great Indian Scientists” published by Cengage Learning India Pvt. Ltd., Delhi, 2017

**REFERENCE BOOKS:**

**R1** Swan, M., “Practical English Usage”, Oxford University Press, 2016.

**R2** Kumar, Sand Latha, P, “Communication Skills”, Oxford University Press, 2018.

**R3** Rizvi Ashraf M., “Effective Technical Communication”, Tata Mc Graw Hill, NewDelhi, 2008.

**R4** Baradwaj Kumkum, “Professional Communication”, I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.

**R5** Wood, F. T., “Remedial English Grammar” , Macmillan, 2007.

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	11-05-2021		TLM2	
2.	<b>Fabric of Change-</b> ‘H.G. Wells and the Uncertainties of Progress– Peter J. Bowler’	01	15-05-2021		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	18-05-2021		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	22-05-2021		TLM2	
5.	Adjectives and adverbs	01	25-05-2021		TLM2	
6.	Degrees of Comparison	01	29-05-2021		TLM2	
7.	Writing: Information Transfer.	01	01-06-2021		TLM2 TLM6	
<b>No. of classes required to complete UNIT-I: 07</b>				<b>No. of classes taken:</b>		

**UNIT-II:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	<b>Tools for Life</b> - ‘Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far’	01	05-06-2021		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	08-06-2021		TLM2	
10.	Active & Passive Voice	01	15-06-2021		TLM2	
11.	Idioms & Phrases	01	19-06-2021		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	01	22-06-2021		TLM2 TLM6	
<b>No. of classes required to complete UNIT-II: 05</b>				<b>No. of classes taken:</b>		

**UNIT-III:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	<b>‘Homi Jahangir Bhabha’</b>	03	26-06-2021 29-06-2021 03-07-2021		TLM2 TLM6	
14.	Words often confused	01	06-07-2021		TLM2	
15.	Common Errors	01	13-07-2021		TLM2	
16.	Report Writing – Types & Formats	01	17-07-2021		TLM2	
17.	Incident and Investigation Reports	01	20-07-2021		TLM2 TLM6	
<b>No. of classes required to complete UNIT-III: 06</b>				<b>No. of classes taken:</b>		

**UNIT-IV:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	<b>Jagadish Chandra Bose</b>	03	24-07-2021 27-07-2021 31-07-2021		TLM2 TLM2	
19.	Use of antonyms	01	03-08-2021		TLM2	
20.	Correction of Sentences	01	07-08-2021		TLM2	
21.	Formal and Informal dialogues	01	10-08-2021		TLM2	
22.	Dialogue Writing.	01	17-08-2021		TLM2 TLM6	
<b>No. of classes required to complete UNIT-IV: 07</b>				<b>No. of classes taken:</b>		

**UNIT-V:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	<b>Prafulla Chandra Ray</b>	03	21-08-2021 28-08-2021 31-08-2021		TLM2	
24.	Analogy	01	04-09-2021		TLM2	
25.	Sentence Completion	01	07-09-2021		TLM2	
26.	Resume - Formats	01	14-09-2021		TLM2	
27.	Writing a Résumé	01	18-09-2021		TLM2 TLM6	
<b>No. of classes required to complete UNIT-V: 07</b>				<b>No. of classes taken:</b>		

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

### PART-C

#### EVALUATION PROCESS (R17 Regulation):

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

### PART-D

#### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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>	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
<b>PSO 2</b>	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
<b>PSO 3</b>	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>M.Anuradha</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. A. Ramireddy</b>
<b>Signature</b>				



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. K. SRIDEVI

Course Name & Code : PCS LAB, 20FE51

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

Credits: 01

Program/Sem/Sec : EEE-B - I SEM

A.Y. : 2022-23

PREREQUISITE: NIL

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** To improve the proficiency of students in English with an emphasis on better communication in formal and informal situations; Develop speaking skills required for expressing their knowledge and abilities and to face interviews with confidence.

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

CO1	Introduce one-self and others using appropriate language and details.	L2
CO2	Comprehend short talks and speak clearly on a specific topic using	L2
CO3	Report effectively after participating in informal discussions ethically.	L1
CO4	Interpret data aptly, ethically & make oral presentations without	L3

**Syllabus: Professional Communication Lab (PCS) shall have two parts:**

- **Computer Assisted Language Learning (CALL) Lab** for 60 students with 60 systems, LAN facility and English language software for self-study by learners.
- **Interactive Communication Skills (ICS) Lab.** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo – audio & video system and camcorder etc.

#### Exercise– I

**CALL Lab: Understand-** Sentence structure.

**ICS Lab: Practice -**Listening: Identifying the topic, the context and specific information, Speaking: Introducing oneself and others.

#### Exercise–II

**CALL Lab: Understand-** Framing questions.

**ICS Lab: Practice-** Listening: Answering a series of questions about main idea and supporting ideas after listening to audio text.

Speaking: Discussing in pairs/small groups on specific topics; Delivering short structured talks using suitable cohesive devices (JAM)

### Exercise–III

**CALL Lab: Understand-** Comprehension practice–Strategies for Effective Communication

**ICS Lab: Practice** - Listening: Listening for global comprehension and Summarizing  
Speaking: Discussing specific topics in pairs/small groups, reporting what is discussed

### Exercise–IV

**CALL Lab: Understand-** Features of Good Conversation–Strategies for Effective Communication.

**ICS Lab: Practice** -Listening: making predictions while listening to conversations/transactional dialogues with/without video Speaking: Role – plays – formal & informal – asking for and giving information/directions/instructions/suggestions

### Exercise– V

**CALL Lab: Understand-** Features of Good Presentation, Methodology of Group Discussion

**ICS Lab: Practice** –Introduction to Group Discussions.

Listening: Answering questions, identifying key terms and understanding concepts.

Speaking: Formal Oral & Poster presentations on topics from academic contexts without the use of PPT.

### Lab Manual:

1. Prabhavati .Y & etal, “English All Round–Communication Skills for Undergraduate Learners” , Orient Black Swan, Hyderabad, 2019.

### Suggested Software:

1. Digital Mentor: Globarena, Hyderabad,2005
2. Sky Pronunciation Suite: Young India Films, Chennai,2009
3. Mastering English in Vocabulary, Grammar, Spelling, Composition, Dorling Kindersley, USA, 2001
4. Dorling Kindersley Series of Grammar, Punctuation, Composition, USA, 2001
5. Oxford Talking Dictionary, The Learning Company, USA, 2002
6. Learning to Speak English- 4CDs. The Learning Company, USA, 2002
7. Cambridge Advanced Learners English Dictionary (CD).Cambridge University Press, New Delhi, 2008.

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	02	14-03-2023		TLM4	
2.	Self Introduction & Introducing others	02	21-03-2023 28-03-2023		TLM4	
3.	Self Introduction & Introducing others	02	04-04-2023 11-04-2023		TLM4	
4.	JAM- I(Short and Structured Talks)	02	18-04-2023		TLM4	
5.	JAM-II(Short and Structured Talks)	02	25-04-2023		TLM4	
6.	Role Play-I(Formal and Informal)	04	02-05-2023 09-05-2023		TLM4	
7.	Role Play-II (Formal and Informal)	02	23-05-2023		TLM4	
8.	Group Discussion-I (Reporting the discussion)	02	30-05-2023 06-06-2023		TLM4, TLM6	
9.	Group Discussion-II	02	13-06-2023		TLM4, TLM6	
10.	Oral & Poster Presentation	02	20-06-2023 27-06-2023		TLM2, TLM4	
11.	Lab Internal Exam	02	04-07-2023			
<b>No. of classes required to complete Syllabus: 24</b>				<b>No. of classes taken:</b>		

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

## PART-C

### EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Cumulative Internal Examination (CIE): M	15
Semester End Examination (SEE)	35
Total Marks = CIE + SEE	50

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
<b>PO 6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to 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.

	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>Ms. K. Sridevi</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. A. Ramireddy</b>
<b>Signature</b>				



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## FRESHMAN ENGINEERING DEPARTMENT

### COURSE HANDOUT

#### PART-A

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

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

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

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

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

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

#### **TEXTBOOKS:**

**T1** Dr. B.S. Grewal, “Higher Engineering Mathematics”, 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.

#### **REFERENCE BOOKS:**

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

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

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	14/03/23		TLM1	

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to UNIT I	1	15/03/23		TLM1	
3.	Matrices and rank of a matrix	1	16/03/23		TLM1	
4.	Echelon form of a matrix	1	17/03/23		TLM1	
5.	Normal form of a matrix	1	21/03/23		TLM1	
6.	Normal form of a matrix	1	23/03/23		TLM1	
7.	PAQ form	1	24/03/23		TLM1	
8.	Solution of Non-homogeneous linear system of equations	1	28/03/23		TLM1	
9.	Solution of Non-homogeneous Linear system of equations	1	29/03/23		TLM1	
10.	Solution of Homogeneous Linear system of equations	1	31/03/23		TLM1	
11.	<b>Tutorial 1</b>	1	04/04/23		TLM3	
12.	Solution of Homogeneous Linear system of equations	1	06/04/23		TLM1	
<b>No. of classes required to complete UNIT-I: 11</b>				<b>No. of classes taken:</b>		

**UNIT-II: Eigen values and Eigen Vectors**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	11/04/23		TLM1	
14.	Eigen values of a matrix	1	12/04/23		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	13/04/23		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	18/04/23		TLM1	
17.	Properties	1	19/04/23		TLM1	
18.	Properties		20/04/23			
19.	Cayley – Hamilton Theorem.	1	21/04/23		TLM1	
20.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	25/04/23		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	26/04/23		TLM1	
22.	<b>Tutorial 2</b>	1	27/04/23		TLM3	
<b>No. of classes required to complete UNIT-II: 10</b>				<b>No. of classes taken:</b>		

**UNIT-III: Laplace Transforms**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	28/04/23		TLM1	
24.	Standard forms of Laplace Transforms.	1	02/05/23		TLM1	
25.	Linear Property, Shifting Theorem.	1	03/05/23		TLM1	
26.	Change of scale property, Multiplication by t.	1	04/05/23		TLM1	
27.	Multiplication by t.	1	05/05/23		TLM1	
<b>I MID EXAMINATIONS (08-05-2023 TO 13-05-2023)</b>						

28.	Division by t	1	16/05/23		TLM1	
29.	Laplace transforms of derivatives.	1	17/05/23		TLM1	
30.	Laplace transforms of Integrals.	1	18/05/23		TLM1	
31.	<b>Tutorial 3</b>	1	19/05/23		TLM3	
32.	Unit step function and Dirac's delta function.	1	23/05/23		TLM1	
33.	Application of Laplace Transforms.	1	24/05/23		TLM1	
<b>No. of classes required to complete UNIT-III: 11</b>				<b>No. of classes taken:</b>		

#### UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to UNIT IV.	1	25/05/23		TLM1	
35.	Linear property.	1	26/05/23		TLM1	
36.	First Shifting properties.	1	30/05/23		TLM1	
37.	Inverse transforms properties	1	31/05/23		TLM1	
38.	Problems	1	01/06/23		TLM1	
39.	Inverse Laplace transform by using partial fractions.	1	02/06/23		TLM1	
40.	Inverse Laplace transform by using partial fractions.	1	06/06/23		TLM1	
41.	Inverse Laplace Transform by using Convolution theorem.	1	07/06/23		TLM1	
42.	Inverse Laplace Transform by using Convolution theorem.	1	08/06/23		TLM1	
43.	Solving of Ordinary differential equation by Laplace transform method.	1	09/06/23		TLM1	
44.	Solving of Ordinary differential equation by Laplace transform method.	1	13/06/23		TLM1	
45.	<b>Tutorial 4</b>	1	14/06/23		TLM3	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

#### UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to UNIT V.	1	15/06/23		TLM1	
47.	Standard forms of Z- Transform.	1	16/06/23		TLM1	
48.	Damping rule	1	20/06/23		TLM1	
49.	Shifting Rule	1	21/06/23		TLM1	
50.	Initial and final value theorems.	1	22/06/23		TLM1	
51.	Other properties	1	23/06/23		TLM1	
52.	Inverse Z – Transforms by using partial fractions.	1	27/06/23		TLM1	
53.	Inverse Z – Transform by using convolution theorem.	1	28/06/23		TLM1	
54.	Inverse Z – Transform by using convolution theorem.	1	30/06/23		TLM1	
55.	Solving of Difference equations by using Z – Transforms.	1	04/07/23		TLM1	
56.	Solving of Difference equations by using Z – Transforms.	1	05/07/23		TLM1	
57.	<b>Tutorial 5</b>	1	06/07/23		TLM3	
<b>No. of classes required to complete UNIT-V: 11</b>				<b>No. of classes taken:</b>		

#### 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
58.	Solving Simultaneous equations using Laplace Transforms	1	07/07/23		TLM2	



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

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

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

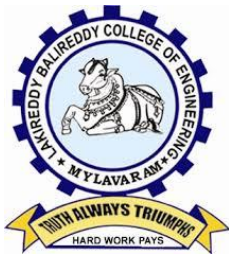
Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV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

### PART-D

#### PROGRAMME OUTCOMES (POs):

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

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



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## FRESHMAN ENGINEERING DEPARTMENT

### COURSE HANDOUT

#### PART-A

<b>PROGRAM/SEM/SEC</b>	: I B. Tech., II-Sem., EEE-B
<b>ACADEMIC YEAR</b>	: 2022-23
<b>COURSE NAME &amp; CODE</b>	: Linear algebra & Transformation Techniques & 20FE04
<b>L-T-P STRUCTURE</b>	: 3-1-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: Dr.K. Bhanu Lakshmi
<b>COURSE COORDINATOR</b>	: Dr. K. Jhansi Rani
<b>PRE-REQUISITES</b>	: Nil

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

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

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

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

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

#### **TEXTBOOKS:**

- T1** Dr. B.S. Grewal, “Higher Engineering Mathematics”, 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.

#### **REFERENCE BOOKS:**

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	13/03/23		TLM1	

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to UNIT I	1	14/03/23		TLM1	
3.	Matrices and rank of a matrix	1	16/03/23		TLM1	
4.	Echelon form of a matrix	1	17/03/23		TLM1	
5.	Normal form of a matrix	1	20/03/23		TLM1	
6.	Normal form of a matrix	1	21/03/23		TLM1	
7.	PAQ form	1	23/03/23		TLM1	
8.	Solution of Non-homogeneous linear system of equations	1	24/03/23		TLM1	
9.	Solution of Non-homogeneous Linear system of equations	1	27/03/23		TLM1	
10.	Solution of Homogeneous Linear system of equations	1	28/03/23		TLM1	
11.	<b>Tutorial 1</b>	1	31/03/23		TLM3	
12.	Solution of Homogeneous Linear system of equations	1	03/04/23		TLM1	
<b>No. of classes required to complete UNIT-I: 11</b>				<b>No. of classes taken:</b>		

**UNIT-II: Eigen values and Eigen Vectors**

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

**UNIT-III: Laplace Transforms**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	25/04/23		TLM1	
24.	Standard forms of Laplace Transforms.	1	27/04/23		TLM1	
25.	Linear Property, Shifting Theorem.	1	28/04/23		TLM1	
26.	Change of scale property, Multiplication by t.	1	01/05/23		TLM1	

27.	Change of scale property, Multiplication by	1	02/05/23		TLM1
28	Multiplication by t.	1	04/05/23		TLM1
29	Multiplication by t.	1	05/05/23		TLM1
<b>II MID EXAMINATIONS (08-05-2023 TO 13-05-2023)</b>					
30	Division by t	1	15/05/23		TLM1
31.	Laplace transforms of derivatives.	1	16/05/23		TLM 1
32.	Laplace transforms of Integrals.	1	18/05/23		TLM1
33.	<b>Tutorial 3</b>	1	19/05/23		TLM3
34.	Unit step function and Dirac's delta function.	1	22/05/23		TLM1
35.	Application of Laplace Transforms.	1	23/05/23		TLM1
<b>No. of classes required to complete UNIT-III: 13</b>				<b>No. of classes taken:</b>	

### UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Introduction to UNIT IV.	1	25/05/23		TLM1	
37.	Linear property.	1	26/05/23		TLM1	
38.	First Shifting properties.	1	29/05/23		TLM1	
39.	Inverse transforms properties	1	30/05/23		TLM1	
40.	Problems	1	01/06/23		TLM1	
41.	Inverse Laplace transform by using partial fractions.	1	02/06/23		TLM1	
42.	Inverse Laplace transform by using partial fractions.	1	05/06/23		TLM1	
43.	Inverse Laplace Transform by using Convolution theorem.	1	06/06/23		TLM1	
44.	Inverse Laplace Transform by using Convolution theorem.	1	08/06/23		TLM1	
45.	Solving of Ordinary differential equation by Laplace transform method.	1	09/06/23		TLM1	
46.	Solving of Ordinary differential equation by Laplace transform method.	1	12/06/23		TLM1	
47.	<b>Tutorial 4</b>	1	13/06/23		TLM3	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

### UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48.	Introduction to UNIT V.	1	15/06/23		TLM1	
49.	Standard forms of Z- Transform.	1	16/06/23		TLM1	
50.	Damping rule	1	19/06/23		TLM1	
51.	Shifting Rule	1	20/06/23		TLM1	
52.	Initial and final value theorems.	1	22/06/23		TLM1	
53.	Other properties	1	23/06/23		TLM1	
54.	Inverse Z – Transforms by using partial fractions.	1	26/06/23		TLM1	
55.	Inverse Z – Transform by using convolution theorem.	1	27/06/23		TLM1	
56.	Inverse Z – Transform by using convolution theorem.		30/06/23			
57.	Solving of Difference equations by using Z – Transforms.	1	03/07/23		TLM1	
58.	Solving of Difference equations by using Z – Transforms.	1	04/07/23		TLM1	
59.	<b>Tutorial 5</b>	1	06/07/23		TLM3	
<b>No. of classes required to complete UNIT-V: 12</b>				<b>No. of classes taken:</b>		

### Contents beyond the Syllabus

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

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

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

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

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

### PART-D

#### PROGRAMME OUTCOMES (POs):

PO 1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<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.
PO 3	<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.
PO 4	<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.
PO 5	<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.
PO 6	<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.
PO 7	<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.
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	<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.
PO 11	<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.
PO 12	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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





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Phone: 08659-222933, Fax: 08659-222931

**DEPARTMENT OF FRESHMAN ENGINEERING**

**COURSE HANDOUT**

**PART-A**

**Name of Course Instructor** : Dr. V.Parvathi  
**Course Name & Code** : Applied Chemistry & 20FE05  
**L-T-P Structure** : 3-0-0 **Credits: 03**  
**Program/Sem/Sec** : B.Tech/II-sem/EEE-A **A.Y. : 2022-23**

**PREREQUISITE:** Nil

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of water, fuel technologies, electrochemistry, corrosion and advanced materials used in technologies.

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

CO1	Identify the troubles due to hardness of water and its maintenance in industrial applications. (Understand-L2)
CO2	Identify issues related to conventional fuels, biofuels and photo-voltaic cells in energy production. (Understand-L2)
CO3	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications. (Apply-L3)
CO4	Apply principles of corrosion for design and effective maintenance of various equipments. (Apply-L3)
CO5	Analyse the suitability of engineering materials like polymers, lubricants, nano materials and composites in technological applications. (Understand-L2)

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

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

**BOS APPROVED TEXT BOOKS:****TEXT BOOKS**

1. Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3<sup>rd</sup> Edition, 2003.
2. Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16<sup>th</sup> Edition, 2015.

**REFERENCES**

1. Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1<sup>st</sup> Edition, 2015.
2. S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12<sup>th</sup> Edition, 2010.
3. Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1<sup>st</sup> Edition, 2009.

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Bridge Course	1	14.03.2023		TLM1	
2.	Bridge Course	1	15.03.2023		TLM1	
3.	Bridge Course	1	17.03.2023		TLM1	
4.	Bridge Course	1	18.03.2023		TLM1	
5.	Introduction to Applied Chemistry, Sources of water & quality	1	21.03.2023		TLM1	
6.	Hardness & types of hardness, Units of hardness & interrelation	1	24.03.2023		TLM1	
7.	Problems on hardness-1	1	25.03.2023		TLM3	
8.	Problems on hardness-2	1	28.03.2023		TLM3	
9.	Scale and sludges, Caustic embrittlement	1	29.03.2023		TLM1	
10.	priming and foaming, Bolier corrosion	1	31.03.2023		TLM1	
11.	W.H.O standards of potable water, Ion exchange process	1	01.04.2023		TLM1	
12.	Reverse osmosis and electro-dialysis	1	04.04.2023		TLM1	
13.	Treatment of		08.04.2023		TLM1	



	industrial waste water					
14.	Revision, Assignment & Quiz	1	11.04.2023		TLM1	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

### UNIT-II: Fuel Technology

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Characteristics of good fuel, comparative study of solid, liquid & gaseous fuels	1	12.04.2023		TLM1	
2.	GCV, LCV and coal origin	1	15.04.2023		TLM1	
3.	Proximate Analysis & significance	1	18.04.2023		TLM1	
4.	Petroleum-origin, types of crude oil and refining of petroleum	1	19.04.2023		TLM1	
5.	Cracking - moving bed catalytic cracking, synthetic petrol –Fischer Tropsch's process	1	21.04.2023		TLM1	
6.	Natural gas composition and C.N.G - advantages	1	25.04.2023		TLM1	
7.	Characteristics of bio fuels, sources of bio mass & advantages - Production of biodiesel from rape seed oil	1	26.04.2023		TLM1	
8.	Photovoltaic cell design working, advantages and disadvantages	1	28.04.2023		TLM1	
9.	Practise of flow charts	1	29.04.2023		TLM3	
10.	Revision, Assignment & Quiz	1	02.05.2023		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

### UNIT-III: Electrochemistry and Batteries

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	HOD Sign
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		Required	Completion	Completion	Methods	Weekly
1.	Introduction to electrochemistry	1	03.05.2023		TLM1	
2.	Types of electrodes, Calomel Electrode	1	05.05.2023		TLM1	
3.	Glass Electrode	1	06.05.2023		TLM4	
4.	Calculation of EMF of Cell	1	16.05.2023		TLM1	
5.	Practice exercises	1	17.05.2023		TLM1	
6.	Applications of Electro chemical Series, Applications of Nernst Equation-1	1	19.05.2023		TLM1	
7.	Lead-acid Battery	1	20.05.2023		TLM1	
8.	Lithium ion Battery	1	23.05.2023		TLM1	
9.	H <sub>2</sub> - O <sub>2</sub> Fuel Cell, Mg-Cu reserve battery	1	24.05.2023		TLM1	
10.	Revision, Assignment & Quiz	1	26.05.2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

#### UNIT-IV: IV Science of corrosion

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to corrosion.	1	27.05.2023		TLM2	
2.	Types of dry corrosion-oxidative corrosion, Pilling Bed worth rule	1	30.05.2023		TLM2	
3.	corrosion by other gases and liquid metal corrosion	1	31.05.2023		TLM2	
4.	Wet corrosion, mechanism	1	02.06.2023		TLM2	
5.	Concentration Cell Corrosion	1	03.06.2023		TLM2	
6.	Passivity and Galvanic series	1	06.06.2023		TLM2	
7.	Nature of metal that influences rate of corrosion	1	07.06.2023		TLM2	
8.	Nature of environment	1	09.06.2023		TLM2	
9.	Cathodic Protection	1	10.06.2023		TLM2	
10.	electro plating and metal cladding	1	13.06.2023		TLM2	
11.	Revision, Assignment & Quiz	1	14.06.2023		TLM2	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

**UNIT-V: Chemistry of Engineering Materials**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Differences between thermoplasts and thermosets, Types of polymerization with examples	1	16.06.2023		TLM2	
2.	Preparation properties and engineering applications of PVC, Teflon, BUNA-S and Polyurethane.	1	17.06.2023		TLM2	
3.	Preparation properties and engineering applications of BUNA-S and Polyurethane	1	20.06.2023		TLM2	
4.	Practice of equations in polymers.	1	21.06.2023			
5.	Characteristics of a good lubricant and properties of lubricants; Application of lubricants	1	23.06.2023		TLM1	
6.	Nano Materials Introduction, definition, extraordinary changes observed at nano size of materials and reasons	1	24.06.2023		TLM2	
7.	Types of nano-materials, Gas-Phase synthesis	1	27.06.2023		TLM2	
8.	Applications of nano-materials.	1	28.06.2023		TLM2	
9.	Composites, advantageous characteristics of composites, Constitu	1	30.06.2023		TLM1	
10.	Fibre reinforced composites (GFRP,	1	01.07.2023		TLM1	
11.	CFRP), Reasons for failure of	1	04.07.2023			

	composites					
12.	Revision, Assignment, Quiz	1	05.07.2023		TLM1	
No. of classes required to complete UNIT-V: 12			No. of classes taken:			

CONTENTS BEYOND SYLLABUS						
1.	Advances in making batteries Design principles to minimize corrosion.	1	07.07.2023		TLM2	
2.	Polymers in industrial applications, Applications of electroplating with ref to PCBs	1	08.07.2023		TLM2	

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

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<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.

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



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**  
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Institution  
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Phone: 08659-222933, Fax: 08659-222931

**DEPARTMENT OF FRESHMAN ENGINEERING**

**COURSE HANDOUT**

**PART-A**

**Name of Course Instructor** : Dr. V.Parvathi  
**Course Name & Code** : Applied Chemistry & 20FE05  
**L-T-P Structure** : 3-0-0 **Credits: 03**  
**Program/Sem/Sec** : B.Tech/II-sem/EEE-B **A.Y. : 2022-23**

**PREREQUISITE:** Nil

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of water, fuel technologies, electrochemistry, corrosion and advanced materials used in technologies.

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

CO1	Identify the troubles due to hardness of water and its maintenance in industrial applications. (Understand-L2)
CO2	Identify issues related to conventional fuels, biofuels and photo-voltaic cells in energy production. (Understand-L2)
CO3	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications. (Apply-L3)
CO4	Apply principles of corrosion for design and effective maintenance of various equipments. (Apply-L3)
CO5	Analyse the suitability of engineering materials like polymers, lubricants, nano materials and composites in technological applications. (Understand-L2)

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

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

**BOS APPROVED TEXT BOOKS:****TEXT BOOKS**

1. Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3<sup>rd</sup> Edition, 2003.
2. Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16<sup>th</sup> Edition, 2015.

**REFERENCES**

1. Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1<sup>st</sup> Edition, 2015.
2. S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12<sup>th</sup> Edition, 2010.
3. Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1<sup>st</sup> Edition, 2009.

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Bridge Course	1	13.03.2023		TLM1	
2.	Bridge Course	1	15.03.2023		TLM1	
3.	Bridge Course	1	16.03.2023		TLM1	
4.	Bridge Course	1	18.03.2023		TLM1	
5.	Introduction to Applied Chemistry, Sources of water & quality	1	20.03.2023		TLM1	
6.	Hardness & types of hardness, Units of hardness & interrelation	1	23.03.2023		TLM1	
7.	Problems on hardness-1	1	25.03.2023		TLM3	
8.	Problems on hardness-2	1	27.03.2023		TLM3	
9.	Scale and sludges, Caustic embrittlement	1	29.03.2023		TLM1	
10.	priming and foaming, Bolier corrosion	1	01.04.2023		TLM1	
11.	W.H.O standards of potable water, Ion exchange process	1	03.04.2023		TLM1	
12.	Reverse osmosis and electro-dialysis	1	06.04.2023		TLM1	
13.	Treatment of		08.04.2023		TLM1	

	industrial waste water					
14.	Revision, Assignment & Quiz	1	10.04.2023		TLM1	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

### UNIT-II: Fuel Technology

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Characteristics of good fuel, comparative study of solid, liquid & gaseous fuels	1	12.04.2023		TLM1	
2.	GCV, LCV and coal origin	1	15.04.2023		TLM1	
3.	Proximate Analysis & significance	1	17.04.2023		TLM1	
4.	Petroleum-origin, types of crude oil and refining of petroleum	1	19.04.2023		TLM1	
5.	Cracking - moving bed catalytic cracking, synthetic petrol - Fischer Tropsch's process	1	20.04.2023		TLM1	
6.	Natural gas composition and C.N.G - advantages	1	24.04.2023		TLM1	
7.	Characteristics of bio fuels, sources of bio mass & advantages - Production of biodiesel from rape seed oil	1	26.04.2023		TLM1	
8.	Photovoltaic cell design working, advantages and disadvantages	1	27.04.2023		TLM1	
9.	Practise of flow charts	1	29.04.2023		TLM3	
10.	Revision, Assignment & Quiz	1	01.05.2023		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

### UNIT-III: Electrochemistry and Batteries

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	HOD Sign
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		Required	Completion	Completion	Methods	Weekly
1.	Introduction to electrochemistry	1	03.05.2023		TLM1	
2.	Types of electrodes, Calomel Electrode	1	04.05.2023		TLM1	
3.	Glass Electrode	1	06.05.2023		TLM4	
4.	Calculation of EMF of Cell	1	15.05.2023		TLM1	
5.	Practice exercises	1	17.05.2023		TLM1	
6.	Applications of Electro chemical Series, Applications of Nernst Equation-1	1	18.05.2023		TLM1	
7.	Lead-acid Battery	1	20.05.2023		TLM1	
8.	Lithium ion Battery	1	22.05.2023		TLM1	
9.	H <sub>2</sub> - O <sub>2</sub> Fuel Cell, Mg-Cu reserve battery	1	24.05.2023		TLM1	
10.	Revision, Assignment & Quiz	1	25.05.2023		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

#### UNIT-IV: IV Science of corrosion

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to corrosion.	1	27.05.2023		TLM2	
2.	Types of dry corrosion-oxidative corrosion, Pilling Bed worth rule	1	29.05.2023		TLM2	
3.	corrosion by other gases and liquid metal corrosion	1	31.05.2023		TLM2	
4.	Wet corrosion, mechanism	1	01.06.2023		TLM2	
5.	Concentration Cell Corrosion	1	03.06.2023		TLM2	
6.	Passivity and Galvanic series	1	05.06.2023		TLM2	
7.	Nature of metal that influences rate of corrosion	1	07.06.2023		TLM2	
8.	Nature of environment	1	08.06.2023		TLM2	
9.	Cathodic Protection	1	10.06.2023		TLM2	
10.	electro plating and metal cladding	1	12.06.2023		TLM2	
11.	Revision, Assignment & Quiz	1	14.06.2023		TLM2	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

**UNIT-V: Chemistry of Engineering Materials**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Differences between thermoplasts and thermosets, Types of polymerization with examples	1	15.06.2023		TLM2	
2.	Preparation properties and engineering applications of PVC, Teflon, BUNA-S and Polyurethane.	1	17.06.2023		TLM2	
3.	Preparation properties and engineering applications of BUNA-S and Polyurethane	1	19.06.2023		TLM2	
4.	Practice of equations in polymers.	1	21.06.2023			
5.	Characteristics of a good lubricant and properties of lubricants; Application of lubricants	1	22.06.2023		TLM1	
6.	Nano Materials Introduction, definition, extraordinary changes observed at nano size of materials and reasons	1	24.06.2023		TLM2	
7.	Types of nano-materials, Gas-Phase synthesis	1	26.06.2023		TLM2	
8.	Applications of nano-materials.	1	28.06.2023		TLM2	
9.	Composites, advantageous characteristics of composites, Constitu	1	30.06.2023		TLM1	
10.	Fibre reinforced composites (GFRP,	1	01.07.2023		TLM1	
11.	CFRP), Reasons for failure of	1	03.07.2023			

	composites					
12.	Revision, Assignment, Quiz	1	05.07.2023		TLM1	
No. of classes required to complete UNIT-V: 12			No. of classes taken:			

CONTENTS BEYOND SYLLABUS						
1.	Advances in making batteries Design principles to minimize corrosion.	1	06.07.2023		TLM2	
2.	Polymers in industrial applications, Applications of electroplating with ref to PCBs	1	08.07.2023		TLM2	

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

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<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.

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



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr.B.Pangedaiiah  
 Course Name & Code : Programming for Problem Solving Using C (20CS01)  
 L-T-P Structure : 3-0-0 Credits : 3  
 Program/Sem/Sec : B.Tech. -EEE / II Sem /A sec A.Y.: 2022-23

#### PRE-REQUISITE:NI:

**COURSE EDUCATIONAL OBJECTIVE (CEO):** The Objective of the course is to make learn the basic elements of C programming, control structures, derived data types, Modular programming, user defined structures, basics of files and its I/O operations.

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

<b>CO1:</b>	Familiar with syntax and semantics of the basic programming language constructs	Understand – Level 2
<b>CO2:</b>	Construct derived data types like arrays in solving problem	Apply – Level 3
<b>CO3:</b>	Decompose a problem into modules and reconstruct it using various ways of user-defined functions	Apply – Level 3
<b>CO4:</b>	Use user-defined data types like structures and unions and its applications to solve problems	Apply – Level 3
<b>CO5:</b>	Discuss various file I/O operations and its application	Understand – Level 2

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>C01</b>	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<b>C02</b>	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C03</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C04</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C05</b>	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-

1 – Low 2 – Medium 3 – High

#### TEXTBOOKS:

**T1:** Reema Thareja, Programming in C, Oxford University Press, 2nd Edition, 2015

#### REFERENCE BOOKS:

**R1:** Jeri R.Hanly, Elliot B.Koffman, Problem Solving and Program Design in C, Pearson Publishers, 7<sup>th</sup> Edition, 2013

**R2:** E Balagurusamy, Computer Programming, McGraw Hill Education, 8<sup>th</sup> Edition

**R3:** C: The Complete Reference, McGraw Hall Education, 4<sup>th</sup> Edition.

**R4:** Pradeep Dey, Manas Ghosh, Programming in C, Oxford University Press, 2<sup>nd</sup> Edition, 2011.

**R5:** Stephen G.Kochan, Programming in C, Pearson Education, 3<sup>rd</sup> Edition, 2005.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT – I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	<b>Introduction to Problem solving through C Programming:</b> Problem Specification, Algorithm, Pseudo Code	1	13/03/2023			
2.	Flowchart, Examples on Algorithm and Flowcharts	1	14/03/2023			
3.	<b>C Programming:</b> Structure of C Program, Identifiers, Basic Data Types and Sizes	1	15/03/2023			
4.	Constants, Variables, Input – Output Statements, A sample C Program	1	17/03/2023			
5.	Operators Part – I	1	20/03/2023			
6.	Operators Part – II	1	21/03/2023			
7.	Expressions, Type Conversions, Conditional Expression	1	24/03/2023			
8.	Precedence of Operators, Order of Evaluation	1	28/03/2023			
9.	<b>Control statements:</b> if, if else	1	29/03/2023			
10.	else if ladder and nested if	1	31/03/2023			
11.	switch statement					
12.	while loop, do-while loop	1	03/04/2023			
13.	for loop	1	04/04/2023			
14.	break, continue, go to and labels	1	05/04/2023			
<b>No. of classes required to complete UNIT – I: 13</b>				<b>No. of classes taken:</b>		

#### UNIT – II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	<b>Arrays:</b> Definition, Types of Arrays	1	10/04/2023			
16.	1D-Array Syntax, Declaration, and Initialization	1	11/04/2023			
17.	Storing and Accessing Elements in 1D-Array	1	12/04/2022			
18.	<b>Applications of 1D-Array:</b> Linear Search and Binary Search, Bubble Sort Algorithm	1	17/04/2023			
19.	Two-Dimensional Array Syntax, Declaration, and Initialization	1	18/04/2023			
20.	Storing and Accessing Elements in 2D-Array	1	19/04/2023			
21.	Applications of 2D Arrays	1	21/04/2023			
22.	Multi-Dimensional Arrays	1	24/04/2023			
23.	<b>Character Arrays:</b> Declaration, Initialization, Reading and Writing Strings	1	25/04/2023			
24.	String Handling Functions Part – I	1	26/04/2023			
25.	String Handling Functions Part – II					
26.	Pre-processor Directives Part – I	1	28/04/2023			
27.	Pre-processor Directives Part – II					
<b>No. of classes required to complete UNIT – II: 11</b>				<b>No. of classes taken:</b>		

**UNIT – III:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
28.	<b>Pointers:</b> Definition, Declaration, Initialization of Pointer Variable	1	01/05/2023				
29.	Pointer Expressions	1	02/05/2023				
30.	Pointer Arithmetic	1	03/05/2023				
31.	Pointers and Arrays	1	05/05/2023				
32.	Pointers and Character Arrays	1	15/05/2023				
33.	Pointers to Pointers	1	16/05/2023				
34.	<b>Functions:</b> Basics, Category of Functions	1	17/05/2023				
35.	Parameter Passing Techniques	1	19/05/2023				
36.	Recursive Functions						
37.	Functions with Arrays	1	22/05/2023				
38.	Standard Library Functions						
39.	Dynamic Memory Management Functions	1	23/05/2023				
40.	Command Line Arguments	1	24/05/2023				
41.	<b>Storage Classes:</b> auto, register, static and extern						
<b>No. of classes required to complete UNIT – III: 11</b>				<b>No. of classes taken:</b>			

**UNIT – IV:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
42.	<b>Derived Types:</b> <b>Structure:</b> Definition and Declaration	1	26/05/2023				
43.	Initialization and Accessing Structures	1	29/05/2023				
44.	Nested Structures	1	30/05/2023				
45.	Arrays of Structures	1	31/05/2023				
46.	Structures and Functions	1	2/06/2023				
47.	Pointers to Structures Part – I	1	5/06/2023				
48.	Pointers to Structures Part – II	1	6/06/2023				
49.	Self-Referential Structures	1	7/06/2023				
50.	<b>Union:</b> Definition and Declaration	2	09/06/2023 & 12/06/2023				
51.	Initialization and Accessing Union Elements						
52.	Examples on Union	1	13/06/2023				
53.	Structure vs Union						
54.	Typedef	1	14/06/2023				
<b>No. of classes required to complete UNIT – IV: 12</b>				<b>No. of classes taken:</b>			

**UNIT – V:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
55.	Files: Definition, Types of Files	1	16/06/2023			
56.	Text files and Binary files	1	19/06/2023			
57.	Stream	1	20/06/2023			
58.	Standard I/O and Formatted I/O	1	21/06/2023			

59.	Types of File I/O Operations	1	23/06/2023		
60.	Creation of a new file	1	26/06/2023		
61.	Opening an existing file	1	27/06/2023		
62.	Reading from file	1	28/06/2023		
63.	Writing to a file	1	30/06/2023		
64.	Moving to a specific location in a file and closing a file	1	3/07/2023		
65.	Error Handling Basics	1	4/07/2023		
66.	Error Handling Function Calls	2	5/07/2023 &7/07/2023		
<b>No. of classes required to complete UNIT - V:13</b>				<b>No. of classes taken:</b>	

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

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

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

#### ACADEMIC CALENDER

##### B.Tech (II Semester)

B.Tech (II Semester)			
Commencement of Class Work	13-03-2023		
I Phase of Instructions	13-03-2023	06-05-2023	8 W
I MID Examinations	08-05-2023	13-05-2023	1 W
II Phase of Instructions	15-05-2023	08-07-2023	8 W
II MID Examinations	10-07-2023	15-07-2023	1 W
Preparation and Practicals	17-07-2023	22-07-2023	1 W
Semester End Examinations	24-07-2023	05-08-2023	2 W
Commencement of Next Semester Class Work	07-08-2023		



## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO1</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>PO2</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>PO3</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>PO4</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>PO5</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>PO6</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>PO7</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>PO8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</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>PO10</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>PO11</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>PO12</b>	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.B.Pangedaiah		Dr. Y.V. Bhaskar Reddy	Dr. J.Siva Vara Prasad
Signature				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Mrs.R.Padma  
 Course Name & Code : Programming for Problem Solving Using C (20CS01)  
 L-T-P Structure : 3-0-0 Credits : 3  
 Program/Sem/Sec : B.Tech. -EEE / II Sem /B sec A.Y.: 2022-23

#### PRE-REQUISITE:NI:

**COURSE EDUCATIONAL OBJECTIVE (CEO):**The Objective of the course is to make learn the basic elements of C programming, control structures, derived data types, Modular programming, user defined structures, basics of files and its I/O operations.

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

<b>CO1:</b>	Familiar with syntax and semantics of the basic programming language constructs	Understand – Level 2
<b>CO2:</b>	Construct derived data types like arrays in solving problem	Apply – Level 3
<b>CO3:</b>	Decompose a problem into modules and reconstruct it using various ways of user-defined functions	Apply – Level 3
<b>CO4:</b>	Use user-defined data types like structures and unions and its applications to solve problems	Apply – Level 3
<b>CO5:</b>	Discuss various file I/O operations and its application	Understand – Level 2

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>C01</b>	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<b>C02</b>	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C03</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C04</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>C05</b>	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-

1 – Low 2 – Medium 3 – High

#### TEXTBOOKS:

**T1:** Reema Thareja, Programming in C, Oxford University Press, 2nd Edition, 2015

#### REFERENCE BOOKS:

**R1:** Jeri R.Hanly, Elliot B.Koffman, Problem Solving and Program Design in C, Pearson Publishers, 7<sup>th</sup> Edition, 2013

**R2:** E Balagurusamy, Computer Programming, McGraw Hill Education, 8<sup>th</sup> Edition

**R3:** C: The Complete Reference, McGraw Hall Education, 4<sup>th</sup> Edition.

**R4:** Pradeep Dey, Manas Ghosh, Programming in C, Oxford University Press, 2<sup>nd</sup> Edition, 2011.

**R5:** Stephen G.Kochan, Programming in C, Pearson Education, 3<sup>rd</sup> Edition, 2005.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT – I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	<b>Introduction to Problem solving through C Programming:</b> Problem Specification, Algorithm, Pseudo Code	1	13/03/2023			
2.	Flowchart, Examples on Algorithm and Flowcharts	1	14/03/2023			
3.	<b>C Programming:</b> Structure of C Program, Identifiers, Basic Data Types and Sizes	1	15/03/2023			
4.	Constants, Variables, Input – Output Statements, A sample C Program	1	18/03/2023			
5.	Operators Part – I	1	20/03/2023			
6.	Operators Part – II	1	21/03/2023			
7.	Expressions, Type Conversions, Conditional Expression	1	25/03/2023			
8.	Precedence of Operators, Order of Evaluation	1	27/03/2023			
9.	<b>Control statements:</b> if, if else	1	28/03/2023			
10.	else if ladder and nested if	1	29/03/2023			
11.	switch statement	1	01/04/2023			
12.	while loop, do-while loop	1	03/04/2023			
13.	for loop	1	04/04/2023			
14.	break, continue, go to and labels	1	05/04/2023			
<b>No. of classes required to complete UNIT – I: 14</b>				<b>No. of classes taken:</b>		

#### UNIT – II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	<b>Arrays:</b> Definition, Types of Arrays	1	10/04/2023			
16.	1D-Array Syntax, Declaration, and Initialization	1	11/04/2023			
17.	Storing and Accessing Elements in 1D-Array	1	12/04/2022			
18.	<b>Applications of 1D-Array:</b> Linear Search and Binary Search, Bubble Sort Algorithm	1	15/04/2023			
19.	Two-Dimensional Array Syntax, Declaration, and Initialization	1	17/04/2023			
20.	Storing and Accessing Elements in 2D-Array	1	18/04/2023			
21.	Applications of 2D Arrays	1	19/04/2023			
22.	Multi-Dimensional Arrays	1	24/04/2023			
23.	<b>Character Arrays:</b> Declaration, Initialization, Reading and Writing Strings	1	25/04/2023			
24.	String Handling Functions Part – I	1	26/04/2023			
25.	String Handling Functions Part – II					
26.	Pre-processor Directives Part – I	1	29/04/2023			
27.	Pre-processor Directives Part – II					
<b>No. of classes required to complete UNIT – II: 11</b>				<b>No. of classes taken:</b>		

**UNIT – III:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	<b>Pointers:</b> Definition, Declaration, Initialization of Pointer Variable	1	01/05/2023			
29.	Pointer Expressions	1	02/05/2023			
30.	Pointer Arithmetic	1	03/05/2023			
31.	Pointers and Arrays	1	06/05/2023			
32.	Pointers and Character Arrays	1	15/05/2023			
33.	Pointers to Pointers	1	16/05/2023			
34.	<b>Functions:</b> Basics, Category of Functions	1	17/05/2023			
35.	Parameter Passing Techniques	1	20/05/2023			
36.	Recursive Functions					
37.	Functions with Arrays	1	22/05/2023			
38.	Standard Library Functions					
39.	Dynamic Memory Management Functions	1	23/05/2023			
40.	Command Line Arguments	1	24/05/2023			
41.	<b>Storage Classes:</b> auto, register, static and extern					
<b>No. of classes required to complete UNIT – III: 11</b>				<b>No. of classes taken:</b>		

**UNIT – IV:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	<b>Derived Types:</b> <b>Structure:</b> Definition and Declaration	1	27/05/2023			
43.	Initialization and Accessing Structures	1	29/05/2023			
44.	Nested Structures	1	30/05/2023			
45.	Arrays of Structures	1	31/05/2023			
46.	Structures and Functions	1	3/06/2023			
47.	Pointers to Structures Part – I	1	5/06/2023			
48.	Pointers to Structures Part – II	1	6/06/2023			
49.	Self-Referential Structures	1	7/06/2023			
50.	<b>Union:</b> Definition and Declaration	1	12/06/2023			
51.	Initialization and Accessing Union Elements					
52.	Examples on Union	1	13/06/2023			
53.	Structure vs Union					
54.	Typedef	1	14/06/2023			
<b>No. of classes required to complete UNIT – IV: 11</b>				<b>No. of classes taken:</b>		

**UNIT – V:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
55.	Files: Definition, Types of Files	1	17/06/2023			
56.	Text files and Binary files	1	19/06/2023			
57.	Stream	1	20/06/2023			
58.	Standard I/O and Formatted I/O	1	21/06/2023			

59.	Types of File I/O Operations	1	24/06/2023		
60.	Creation of a new file	1	26/06/2023		
61.	Opening an existing file	1	27/06/2023		
62.	Reading from file	1	28/06/2023		
63.	Writing to a file	1	1/07/2023		
64.	Moving to a specific location in a file and closing a file	1	3/07/2023		
65.	Error Handling Basics	1	4/07/2023		
66.	Error Handling Function Calls	1	5/07/2023		
<b>No. of classes required to complete UNIT - V:12</b>				<b>No. of classes taken:</b>	

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

## PART-C

### EVALUATION PROCESS (R20 Regulation):

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

### ACADEMIC CALENDER

#### B.Tech (II Semester)

B.Tech (II Semester)			
Commencement of Class Work	13-03-2023		
I Phase of Instructions	13-03-2023	06-05-2023	8 W
I MID Examinations	08-05-2023	13-05-2023	1 W
II Phase of Instructions	15-05-2023	08-07-2023	8 W
II MID Examinations	10-07-2023	15-07-2023	1 W
Preparation and Practicals	17-07-2023	22-07-2023	1 W
Semester End Examinations	24-07-2023	05-08-2023	2 W
Commencement of Next Semester Class Work	07-08-2023		

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO1</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>PO2</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>PO3</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>PO4</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>PO5</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>PO6</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>PO7</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>PO8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</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>PO10</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>PO11</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>PO12</b>	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs R.Padma		Dr. Y.V. Bhaskar Reddy	Dr. J.Siva Vara Prasad
Signature				



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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Dr.K.R.L.Prasad

**Course Name & Code** : Fundamentals of Electrical Engineering & 20EE04

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

**Credits:** 3

**Program/Sem/Sec** : B.TECH /II /A

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

**PREREQUISITE:** Applied Physics and Differential Equations

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

The objective of this course is to introduce the basic concepts of electrical circuits which is the foundation for all courses in Electrical and Electronics Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes single phase circuits, magnetic circuits and theorems.

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

<b>CO1</b>	Apply network reduction techniques to simplify electrical circuits .(Apply-L3)
<b>CO2</b>	Analyze the electrical circuits using fundamental laws(Apply-L3)
<b>CO3</b>	Analyze magnetic circuits.(Understand-L2)
<b>CO4</b>	Identify a suitable measuring instrument to measure electrical variables.(Understand-L2)
<b>CO5</b>	Determine the circuit parameters using AC and DC bridges.(Apply-L3)

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

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

#### **TEXTBOOKS:**

1. William Hayt and Jack E. Kemmerley, "Engineering Circuit Analysis" ,Mc Graw Hill Company, 9<sup>th</sup> edition, 2019.
2. "A. K. Sawhney", "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.

#### **REFERENCE BOOKS:**

1. Van Valkenburg, "Network Analysis and Synthesis", Pearson publication, 3<sup>rd</sup> edition, 2015.
2. A. Sudhakar, Shyamamohan, S Palli, "Electrical Circuits Analysis-2" Tata McGraw- Hill, 5<sup>th</sup> edition, 2015.
3. N.C. Jagan, C. Lakshmi Narayana, "Network Analysis", BS publications 2<sup>nd</sup> edition, 2008.
4. Charles K Alexander, Mathew. N. O. Sadiku, "Fundamental of Electric Circuits", Tata McGraw- Hill, 6<sup>th</sup> edition, 2019.
5. Chakrabarti A, "Electric Circuits Analysis & Synthesis " Dhanpat Rai & Co (p) Ltd, 6<sup>th</sup> edition, 2014.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: INTRODUCTION TO ELECTRICAL CIRCUITS

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 COs	1	13-03-2023		TLM1	
2.	Introduction to Electrical Circuits	1	14-03-2023		TLM1	
3.	Basic Concepts of passive elements of R, L, C	1	15-03-2023		TLM1	
4.	V-I relations, sources (dependent and independent)	1	17-03-2023		TLM1	
5.	Problems	1	20-03-2023		TLM1	
6.	star-to-delta and delta-to-star transformation	1	21-03-2023		TLM3	
7.	source transformation technique	1	24-03-2023		TLM1	
8.	nodal analysis to DC networks with dependent sources	1	27-03-2023		TLM1	
9.	Problems	1	28-03-2023		TLM3	
10.	mesh analysis to DC networks with dependent sources	1	29-03-2023		TLM1	
11.	nodal analysis and mesh analysis to DC networks with independent sources	1	31-03-2023		TLM1	
12.	Problems	1	03-04-2023		TLM1	
<b>No. of classes required to complete UNIT-I: 12</b>				<b>No. of classes taken:</b>		

#### UNIT-II: SINGLE PHASE AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to Single Phase AC Circuits	1	04-04-2023		TLM1	
14.	R.M.S, average values and form factor for different periodic wave forms	1	10-04-2023		TLM1	
15.	steady state analysis of R, L, C	1	11-04-2023		TLM3	
16.	steady state analysis of R, L, C with sinusoidal excitation	1	12-04-2023		TLM1	
17.	concept of reactance, impedance, susceptance and admittance	1	17-04-2023		TLM1	
18.	Problems	1	18-04-2023		TLM3	
19.	phase and phase difference	1	19-04-2023		TLM1	
20.	concept of complex power, real and reactive power and power factor	1	21-04-2023		TLM1	
21.	Series and parallel resonance	1	24-04-2023		TLM1	



22.	Problems	1	25-04-2023		TLM3	
23.	band width and quality factor	1	26-04-2023		TLM1	
24.	Problems	1	28-04-2023		TLM1	
25.	Problems	1	01-05-2023		TLM1	
<b>No. of classes required to complete UNIT-II: 13</b>				<b>No. of classes taken:</b>		

### UNIT-III: MAGNETIC CIRCUITS

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 to Magnetic Circuits	1	02-05-2023		TLM3	
27.	Basic terminology	1	03-05-2023		TLM1	
28.	analogy between electrical and magnetic circuits	1	05-05-2023		TLM1	
29.	Problems	1	15-05-2023		TLM1	
30.	Faraday's laws of electromagnetic induction	1	16-05-2023		TLM3	
31.	concept of self and mutual inductance	1	17-05-2023		TLM1	
32.	dot convention	1	19-05-2023		TLM1	
33.	Problems	1	22-05-2023		TLM1	
34.	coefficient of coupling	1	23-05-2023		TLM3	
35.	analysis of series magnetic circuits	1	24-05-2023		TLM1	
36.	parallel magnetic circuits	1	26-05-2023		TLM1	
37.	Problems	1	29-05-2023		TLM1	
<b>No. of classes required to complete UNIT-III: 08</b>				<b>No. of classes taken:</b>		

### UNIT-IV: INTRODUCTION TO MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Measuring Instruments	1	30-05-2023		TLM1	
39.	Errors in measurement, Classification	1	31-05-2023		TLM1	
40.	deflecting, control and damping torques	1	02-06-2023		TLM1	
41.	Problems	1	05-06-2023		TLM1	
42.	ammeters and voltmeters	1	06-06-2023		TLM3	
43.	PMMC, moving iron type instruments	1	07-06-2023		TLM1	

44.	shunts and multipliers	1	09-06-2023		TLM1	
45.	Problems	1	12-06-2023		TLM1	
46.	Construction and principle of operation of DC Potentiometer	1	13-06-2023		TLM3	
47.	Current Transformer & Potential Transformer	1	14-06-2023		TLM1	
48.	Singlephase dynamometer wattmeter & Single phase induction type energy meter	1	16-06-2023		TLM1	
49.	Problems	1	19-06-2023		TLM1	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

### UNIT-V: DC & AC BRIDGES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Introduction to DC & AC Bridges	1	20-06-2023		TLM1	
51.	Method of measuring low, medium and high resistance	1	21-06-2023		TLM1	
52.	Wheat-stone's bridge	1	23-06-2023		TLM1	
53.	Kelvin's double bridge	1	26-06-2023		TLM1	
54.	Problems	1	27-06-2023		TLM1	
55.	loss of charge method	1	28-06-2023		TLM1	
56.	Measurement of inductance	1	30-06-2023		TLM1	
57.	Maxwell's bridge, Anderson's bridge	1	03-07-2023		TLM1	
58.	Problems	1	04-07-2023		TLM1	
59.	Measurement of capacitance and loss angle, Wien and Schering Bridge	1	05-07-2023		TLM1	
60.	Content Beyond Syllabus	1	07-07-2023		TLM1	
<b>No. of classes required to complete UNIT-V: 11</b>				<b>No. of classes taken:</b>		

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

### PART-C

#### EVALUATION PROCESS (R17 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<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>	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
<b>PSO 2</b>	Design and analyze electrical machines, modern drive and lighting systems
<b>PSO 3</b>	Specify, design, implement and test analog and embedded signal processing electronic systems
<b>PSO 4</b>	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.K.R.L.Prasad	Dr.K.R.L.Prasad	Dr. P. Sobha Rani	Dr.J.Siva Vara Prasad
Signature				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Mr. P. Srihari

**Course Name & Code** : Fundamentals of Electrical Engineering & 20EE04

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

**Credits:** 3

**Program/Sem/Sec** : B.TECH /II /B

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

**PREREQUISITE:** Applied Physics and Differential Equations

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

The objective of this course is to introduce the basic concepts of electrical circuits which is the foundation for all courses in Electrical and Electronics Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes single phase circuits, magnetic circuits and theorems.

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

<b>CO1</b>	Apply network reduction techniques to simplify electrical circuits .(Apply-L3)
<b>CO2</b>	Analyze the electrical circuits using fundamental laws(Apply-L3)
<b>CO3</b>	Analyze magnetic circuits.(Understand-L2)
<b>CO4</b>	Identify a suitable measuring instrument to measure electrical variables.(Understand-L2)
<b>CO5</b>	Determine the circuit parameters using AC and DC bridges.(Apply-L3)

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

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

#### **TEXTBOOKS:**

1. William Hayt and Jack E. Kemmerley, "Engineering Circuit Analysis" ,Mc Graw Hill Company, 9<sup>th</sup> edition, 2019.
2. "A. K. Sawhney", "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.

#### **REFERENCE BOOKS:**

1. Van Valkenburg, "Network Analysis and Synthesis", Pearson publication, 3<sup>rd</sup> edition, 2015.
2. A. Sudhakar, Shyammoan, S Palli, "Electrical Circuits Analysis-2" Tata McGraw- Hill, 5<sup>th</sup> edition, 2015.
3. N.C. Jagan, C. Lakshmi Narayana, "Network Analysis", BS publications 2<sup>nd</sup> edition, 2008.
4. Charles K Alexander, Mathew. N. O. Sadiku, "Fundamental of Electric Circuits", Tata McGraw- Hill, 6<sup>th</sup> edition, 2019.
4. Chakrabarti A, "Electric Circuits Analysis & Synthesis " Dhanpat Rai & Co (p) Ltd, 6<sup>th</sup> edition, 2014.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: INTRODUCTION TO ELECTRICAL CIRCUITS

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 COs	1	13-03-2023		TLM1	
2.	Introduction to Electrical Circuits	1	15-03-2023		TLM1	
3.	Basic Concepts of passive elements of R, L, C	1	16-03-2023		TLM1	
4.	V-I relations, sources (dependent and independent)	1	16-03-2023		TLM1	
5.	Problems	1	17-03-2023		TLM1	
6.	star-to-delta and delta-to-star transformation	1	20-03-2023		TLM1	
7.	source transformation technique	1	23-03-2023		TLM1	
8.	nodal analysis to DC networks with dependent sources	1	24-03-2023		TLM1	
9.	Problems	1	27-03-2023		TLM1	
10.	mesh analysis to DC networks with dependent sources	1	29-03-2023		TLM1	
11.	nodal analysis and mesh analysis to DC networks with independent sources	1	31-03-2023		TLM3	
12.	Problems	1	03-04-2023		TLM1	
13.	Problems	1	06-04-2023		TLM1	
<b>No. of classes required to complete UNIT-I: 13</b>				<b>No. of classes taken:</b>		

#### UNIT-II: SINGLE PHASE AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Introduction to Single Phase AC Circuits	1	10-04-2023		TLM1	
15.	R.M.S, average values and form factor for different periodic wave forms	1	12-04-2023		TLM3	
16.	steady state analysis of R, L, C	1	13-04-2023		TLM1	
17.	steady state analysis of R, L, C with sinusoidal excitation	1	17-04-2023		TLM1	
18.	concept of reactance, impedance, susceptance and admittance	1	19-04-2023		TLM3	
19.	Problems	1	20-04-2023		TLM1	
20.	phase and phase difference	1	21-04-2023		TLM1	
21.	concept of complex power, real and reactive power and power factor	1	24-04-2023		TLM1	

22.	Series and parallel resonance	1	26-04-2023		TLM3	
23.	Problems	1	27-04-2023		TLM1	
24.	Bandwidth and quality factor	1	28-04-2023		TLM1	
25.	Problems	1	01-05-2023		TLM1	
<b>No. of classes required to complete UNIT-II: 12</b>				<b>No. of classes taken:</b>		

### UNIT-III: MAGNETIC CIRCUITS

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 to Magnetic Circuits	1	03-05-2023		TLM3	
27.	Basic terminology	1	04-05-2023		TLM1	
28.	analogy between electrical and magnetic circuits	1	05-05-2023		TLM1	
29.	Problems	1	15-05-2023		TLM1	
30.	Faraday's laws of electromagnetic induction	1	17-05-2023		TLM3	
31.	concept of self and mutual inductance	1	18-05-2023		TLM1	
32.	dot convention	1	19-05-2023		TLM1	
33.	Problems	1	22-05-2023		TLM1	
34.	coefficient of coupling	1	24-05-2023		TLM3	
35.	analysis of series magnetic circuits	1	25-05-2023		TLM1	
36.	parallel magnetic circuits	1	26-05-2023		TLM1	
37.	Problems	1	29-05-2023		TLM1	
<b>No. of classes required to complete UNIT-III: 08</b>				<b>No. of classes taken:</b>		

### UNIT-IV: INTRODUCTION TO MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Measuring Instruments	1	31-05-2023		TLM1	
39.	Errors in measurement, Classification	1	01-06-2023		TLM1	
40.	deflecting, control and damping torques	1	02-06-2023		TLM1	
41.	Problems	1	05-06-2023		TLM1	
42.	ammeters and voltmeters	1	07-06-2023		TLM3	
43.	PMMC, moving iron type instruments	1	08-06-2023		TLM1	

44.	shunts and multipliers	1	09-06-2023		TLM1	
45.	Problems	1	12-06-2023		TLM1	
46.	Construction and principle of operation of DC Potentiometer	1	14-06-2023		TLM3	
47.	Current Transformer & Potential Transformer	1	15-06-2023		TLM1	
48.	Singlephase dynamometer wattmeter & Single phase induction type energy meter	1	16-06-2023		TLM1	
49.	Problems	1	19-06-2023		TLM1	
<b>No. of classes required to complete UNIT-IV: 12</b>				<b>No. of classes taken:</b>		

### UNIT-V: DC & AC BRIDGES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Introduction to DC & AC Bridges	1	21-06-2023		TLM3	
51.	Method of measuring low, medium and high resistance	1	22-06-2023		TLM1	
52.	Wheat-stone's bridge	1	23-06-2023		TLM1	
53.	Kelvin's double bridge	1	26-06-2023		TLM1	
54.	Problems	1	28-06-2023		TLM3	
55.	loss of charge method	1	30-06-2023		TLM1	
56.	Measurement of inductance, Wien's bridge – Schering Bridge.	1	03-07-2023		TLM1	
57.	Maxwell's bridge, Anderson's bridge	1	05-07-2023		TLM1	
58.	Problems, Measurement of capacitance and loss angle	1	06-07-2023		TLM1	
59.	Content Beyond Syllabus	1	07-07-2023		TLM1	
<b>No. of classes required to complete UNIT-V: 10</b>				<b>No. of classes taken:</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 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15



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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<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>	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
<b>PSO 2</b>	Design and analyze electrical machines, modern drive and lighting systems
<b>PSO 3</b>	Specify, design, implement and test analog and embedded signal processing electronic systems
<b>PSO 4</b>	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. P. Srihari	Dr.K.R.L.Prasad	Dr. P. Sobha Rani	Dr.J.Siva Vara Prasad
Signature				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** DR.A.V.G.A.MARTHANDA

**Course Name & Code** : 20MC01 - CONSTITUTION OF INDIA

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

**Credits:** 0

**Program/Sem/Sec** : B.TECH /II SEM/ A & B

**A.Y.:** 22-23

**PREREQUISITE:** CIVICS

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

<b>CO1</b>	CO1: Understand history and philosophy of constitution with reference to Preamble, Fundamental Rights and Duties (Understand – L2)
<b>CO2</b>	CO2: Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System (Understand – L2).
<b>CO3</b>	CO3: Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions (Understand – L2).
<b>CO4</b>	CO4: learn local administration viz. Panchayat, Block, Municipality and Corporation (Understand – L2).
<b>CO5</b>	CO5: learn about Election Commission and the process and about SC, ST, OBC and women (Understand – L2).

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

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

#### **Reference Books**

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.
2. Subash Kashyap, Indian Constitution, National Book Trust.
3. J.A. Siwach, Dynamics of Indian Government and Politics.
4. D.C. Gupta, Indian Government and Politics.

## PART-B

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

#### **UNIT-I: Introduction to Indian Constitution**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	UNIT - I: Introduction to Indian	1	16/3/2023			
2.	Constitution: 'Constitution' meaning of the term, Indian Constitution – Sources and Constitutional History, Features –	1	18/3/2023		TLM1	
3.	, Fundamental Rights and Duties, Directive Principles of State Policy	1	18/3/2023		TLM2	
4.	Citizenship, Preamble, Fundamental Rights and Duties	1	23/3/2023		TLM1	
5.	Citizenship, Preamble, Fundamental Rights and Duties,	1	25/3/2023		TLM2	
6.	Citizenship, Preamble, Fundamental Rights and Duties	1	30/3/2023		TLM1	
7.	Directive Principles of State Policy	1	1/4/2023		TLM2	
8.	Directive Principles of State Policy	1	6/4/2023		TLM1	
9.	revision	1	8/4/2023		TLM2	
<b>No. of classes required to complete UNIT-I:</b>				<b>No. of classes taken:</b>		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	UNIT - II: Union Government and its Administration Structure of the Indian	1	8/4/2023		TLM1	
11.	Union: Federalism Centre – State relationship, President: Role, Power and Position. ha,	1	10/4/2023		TLM2	
12.	Prime Minister(PM) and Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	13/4/2023		TLM1	
13.	Prime Minister(PM) and	1	15/4/2023		TLM2	
14.	Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	15/4/2023		TLM1	
15.	Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	20/4/2023		TLM2	
16.	Rajya Sabha. The Supreme Court and High Court: Powers and Functions	1	22/4/2023		TLM1	
17.	Rajya Sabha. The Supreme Court and High Court: Powers and Functions	1	27/4/2023		TLM2	
18.	revision	1	29/4/2023			
<b>No. of classes required to complete UNIT-II:</b>				<b>No. of classes taken:</b>		

**UNIT-III: State Government and its Administration**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	UNIT – III:State Government and its Administration Governor – Role and Position – ChiefMinister (CM) and Council of Ministers	1	3/5/2023	08/7/2021		
20.	. ChiefMinister (CM) Functions Council of Ministers. State, Structure and Functions	1	3/5/2023	09/7/2021		
21.	Secretariat: Organization, revision	1	5/5/2023	09/7/2021		
<b>No. of classes required to complete UNIT-III:</b>				<b>No. of classes taken:</b>		

**UNIT-IV: A Local Administration**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	UNIT – IV:A Local Administration – District’s Administration Head – Role and Importance, Municipalities –	1	6/5/2023		<b>TLM1</b>	
23.	Municipal Corporation Panchayati Raj : Functions PanchayatiRaj Institution (PRI), Zilla Panchayat, Elected Officials and their roles	1	11/5/23		<b>TLM2</b>	
24.	Municipal Corporation Panchayati Raj : Functions PanchayatiRaj Institution (PRI), Zilla Panchayat, Elected Officials and their roles	1	13/5/23		<b>TLM1</b>	
25	Villagelevel – Role of Elected and Appointed officials – Importance of grass root	1	18/5/23		<b>TLM2</b>	
26	Villagelevel – Role of Elected officials – Importance of grass root ,revision	1	20/5/23			
<b>No. of classes required to complete UNIT-IV:</b>				<b>No. of classes taken:</b>		

**UNIT-V: Election Commission: Election Commission**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	UNIT – V:Election Commission: Election Commission – Role of Chief Election Commissioner and Election Commissionerate State	1	24/5/23		<b>TLM1</b>	
26.	Election Commission: Functions and Commissions for the welfare of SC/ST/OBC and Women	1	26/5/23		<b>TLM2</b>	
27.	Revision of subject	1	26/5/28			
<b>No. of classes required to complete UNIT-V:</b>				<b>No. of classes taken:</b>		

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

### UNIT-I: Introduction to Indian Constitution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	UNIT - I: Introduction to Indian		13/3/23			
2.	Constitution: 'Constitution' meaning of the term, Indian Constitution – Sources and Constitutional History, Features –	1	14/3/23		TLM1	
3.	, Fundamental Rights and Duties, Directive Principles of State Policy	1	20/3/23		TLM2	
4.	Citizenship, Preamble, Fundamental Rights and Duties	1	21/3/23		TLM1	
5.	Citizenship, Preamble, Fundamental Rights and Duties,	1	27/3/23		TLM2	
6.	Citizenship, Preamble, Fundamental Rights and Duties	1	28/3/23		TLM1	
7.	Directive Principles of State Policy	1	28/3/23		TLM2	
<b>No. of classes required to complete UNIT-I:</b>				<b>No. of classes taken:</b>		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	UNIT - II: Union Government and its Administration Structure of the Indian	1	3/4/23		TLM1	
9.	Union: Federalism Centre – State relationship, President: Role, Power and Position. ha,	1	4/4/23		TLM2	
10.	Prime Minister (PM) and Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	10/4/23		TLM1	
11.	Prime Minister (PM) and	1	11/4/23		TLM2	
12.	Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	11/4/23		TLM1	
13.	Council of Ministers, Cabinet and Central Secretariat, Lok Sab	1	17/4/23		TLM2	
14.	Rajya Sabha. The Supreme Court and High Court: Powers and Functions	1	18/4/23		TLM1	
15.	Rajya Sabha. The Supreme Court and High Court: Powers and Functions	1	28/4/23		TLM2	
			24/4/23			
<b>No. of classes required to complete UNIT-II:</b>				<b>No. of classes taken:</b>		

### UNIT-III: State Government and its Administration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	UNIT - III: State Government and its Administration Governor – Role and Position – Chief Minister (CM) and Council of Ministers	1	17/4/23		TLM1	
2.	. Chief Minister (CM) Functions	1	18/4/23		TLM2	

	Council of Ministers. State, Structure and Functions				
3.	Council of Ministers. State, Structure and Functions	1	24/4/23		<b>TLM1</b>
4	Secretariat: Organization, revision	1	24/4/23		<b>TLM2</b>
	Council of Ministers. State, Structure and Functions	1			

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

**No. of classes taken:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	UNIT – III:State Government and its Administration Governor – Role and Position – ChiefMinister (CM) and Council of Ministers	1	25/4/23		<b>TLM1</b>	
17.	. ChiefMinister (CM) Functions	1	1/5/23		<b>TLM2</b>	
18.	Council of Ministers. State, Structure and Functions Secretariat: Organization	1	1/5/23		<b>TLM1</b>	
19.	revision	1	2/5/23		<b>TLM2</b>	
<b>No. of classes required to complete UNIT-III:</b>						<b>No. of classes taken:</b>

**UNIT-IV: A Local Administration**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20	UNIT – IV:A Local Administration – District’s Administration Head – Role and Importance, Municipalities	1	2/5/23		<b>TLM1</b>	
					<b>TLM2</b>	
21	Panchayati Raj : Functions PanchayatiRaj Institution (PRI),	1	2/5/23		<b>TLM1</b>	
22	PanchayatiRaj Institution (PRI), Zilla Panchayat, Elected Officials and their roles	1	3/5/23		<b>TLM2</b>	
23	Villagelevel – Role of Elected and Appointed officials – Importance of grass root	1				

**UNIT-V: Election Commission**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	UNIT – V:Election Commission: Election Commission – Role of Chief Election Commissioner and Election Commissionerate State	1	9/5/23		<b>TLM1</b>	
2.	Election Commission:	1	10/5/23		<b>TLM2</b>	

	Functions and Commissions for the welfare of SC/ST/OBC and Women Revision				
3.	of subject	1			

No. of classes required to complete UNIT-V:			No. of classes taken:			
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.	UNIT – V:Election Commission: Election Commission – Role of Chief Election	1	10/5/23		TLM1	
21.	Commissioner and Election Commissionerate State Election Commission:	1	15/5/23		TLM2	
22.	Functions and Commissions for the welfare of SC/ST/OBC and Women	1	16/5/23		TLM1	
23.	Revision of subject	1	17/5/23		TLM2	
24.	Revision of subject	1	17/5/23			
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 Regulation):

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



<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.A.V.G.A <b>MARTHANDA</b>	Dr.A.V.G.A. <b>MARTHANDA</b>	Dr.A.V.G.A. <b>MARTHANDA</b>	<b>Dr.JSV Prasad</b>
<b>Signature</b>				



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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. Anuradha M

Course Name & Code : PCS LAB, 20FE51

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

Credits: 01

Program/Sem/Sec : EEE A –I SEM

A.Y. : 2020-21

PREREQUISITE: NIL

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** To improve the proficiency of students in English with an emphasis on better communication in formal and informal situations; Develop speaking skills required for expressing their knowledge and abilities and to face interviews with confidence.

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

CO1	Introduce one-self and others using appropriate language and details.	L2
CO2	Comprehend short talks and speak clearly on a specific topic using	L2
CO3	Report effectively after participating in informal discussions ethically.	L1
CO4	Interpret data aptly, ethically & make oral presentations without	L3

**Syllabus: Professional Communication Lab (PCS) shall have two parts:**

- **Computer Assisted Language Learning (CALL) Lab** for 60 students with 60 systems, LAN facility and English language software for self-study by learners.
- **Interactive Communication Skills (ICS) Lab.** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo – audio & video system and camcorder etc.

#### **Exercise– I**

**CALL Lab: Understand-** Sentence structure.

**ICS Lab: Practice -**Listening: Identifying the topic, the context and specific information, Speaking: Introducing oneself and others.

#### **Exercise–II**

**CALL Lab: Understand-** Framing questions.

**ICS Lab: Practice-** Listening: Answering a series of questions about main idea and supporting ideas after listening to audio text.

Speaking: Discussing in pairs/small groups on specific topics; Delivering short structured talks using suitable cohesive devices (JAM)

### Exercise–III

**CALL Lab: Understand-** Comprehension practice–Strategies for Effective Communication

**ICS Lab: Practice** - Listening: Listening for global comprehension and Summarizing  
Speaking: Discussing specific topics in pairs/small groups, reporting what is discussed

### Exercise–IV

**CALL Lab: Understand-** Features of Good Conversation–Strategies for Effective Communication.

**ICS Lab: Practice** -Listening: making predictions while listening to conversations/transactional dialogues with/without video Speaking: Role – plays – formal & informal – asking for and giving information/directions/instructions/suggestions

### Exercise– V

**CALL Lab: Understand-** Features of Good Presentation, Methodology of Group Discussion

**ICS Lab: Practice** –Introduction to Group Discussions.

Listening: Answering questions, identifying key terms and understanding concepts.

Speaking: Formal Oral & Poster presentations on topics from academic contexts without the use of PPT.

### Lab Manual:

1. Prabhavati .Y & etal, “English All Round–Communication Skills for Undergraduate Learners” , Orient Black Swan, Hyderabad, 2019.

### Suggested Software:

1. Digital Mentor: Globarena, Hyderabad,2005
2. Sky Pronunciation Suite: Young India Films, Chennai,2009
3. Mastering English in Vocabulary, Grammar, Spelling, Composition, Dorling Kindersley, USA, 2001
4. Dorling Kindersley Series of Grammar, Punctuation, Composition, USA, 2001
5. Oxford Talking Dictionary, The Learning Company, USA, 2002
6. Learning to Speak English- 4CDs. The Learning Company, USA, 2002
7. Cambridge Advanced Learners English Dictionary (CD).Cambridge University Press, New Delhi, 2008.

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	02	15-05-2021		TLM4	
2.	Self Introduction & Introducing others	02	22-05-2021		TLM4	
3.	Self Introduction & Introducing others	02	29-05-2021		TLM4	
4.	JAM- I(Short and Structured Talks)	02	05-06-2021		TLM4	
5.	JAM-II(Short and Structured Talks)	02	12-06-2021		TLM4	
6.	Role Play-I(Formal and Informal)	02	19-06-2021		TLM4	
7.	Role Play-II (Formal and Informal)	02	26-06-2021		TLM4	
8.	Group Discussion-I (Reporting the discussion)	02	07-08-2021		TLM4, TLM6	
9.	Group Discussion-II	02	14-08-2021		TLM4, TLM6	
10.	Oral & Poster Presentation	02	21-08-2021		TLM2, TLM4	
11.	Oral & Poster Presentation	02	28-08-2021		TLM2, TLM4	
12.	Oral & Poster Presentation	02	4-09-2021		TLM2, TLM4	
13.	Lab Internal Exam	02	11-09-2021			
<b>No. of classes required to complete Syllabus: 26</b>				<b>No. of classes taken:</b>		

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

## PART-C

### EVALUATION PROCESS (R20 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

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

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

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



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor: Ms. K. SRIDEVI

Course Name & Code : PCS LAB, 20FE51

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

Credits: 01

Program/Sem/Sec : EEE-B - I SEM

A.Y. : 2022-23

PREREQUISITE: NIL

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** To improve the proficiency of students in English with an emphasis on better communication in formal and informal situations; Develop speaking skills required for expressing their knowledge and abilities and to face interviews with confidence.

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

CO1	Introduce one-self and others using appropriate language and details.	L2
CO2	Comprehend short talks and speak clearly on a specific topic using	L2
CO3	Report effectively after participating in informal discussions ethically.	L1
CO4	Interpret data aptly, ethically & make oral presentations without	L3

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- **Computer Assisted Language Learning (CALL) Lab** for 60 students with 60 systems, LAN facility and English language software for self-study by learners.
- **Interactive Communication Skills (ICS) Lab.** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo – audio & video system and camcorder etc.

#### Exercise– I

**CALL Lab: Understand-** Sentence structure.

**ICS Lab: Practice -Listening:** Identifying the topic, the context and specific information, Speaking: Introducing oneself and others.

#### Exercise–II

**CALL Lab: Understand-** Framing questions.

**ICS Lab: Practice-** Listening: Answering a series of questions about main idea and supporting ideas after listening to audio text.

Speaking: Discussing in pairs/small groups on specific topics; Delivering short structured talks using suitable cohesive devices (JAM)

### Exercise–III

**CALL Lab: Understand-** Comprehension practice–Strategies for Effective Communication

**ICS Lab: Practice** - Listening: Listening for global comprehension and Summarizing  
Speaking: Discussing specific topics in pairs/small groups, reporting what is discussed

### Exercise–IV

**CALL Lab: Understand-** Features of Good Conversation–Strategies for Effective Communication.

**ICS Lab: Practice** -Listening: making predictions while listening to conversations/transactional dialogues with/without video Speaking: Role – plays – formal & informal – asking for and giving information/directions/instructions/suggestions

### Exercise– V

**CALL Lab: Understand-** Features of Good Presentation, Methodology of Group Discussion

**ICS Lab: Practice** –Introduction to Group Discussions.

Listening: Answering questions, identifying key terms and understanding concepts.

Speaking: Formal Oral & Poster presentations on topics from academic contexts without the use of PPT.

### Lab Manual:

1. Prabhavati .Y & etal, “English All Round–Communication Skills for Undergraduate Learners” , Orient Black Swan, Hyderabad, 2019.

### Suggested Software:

1. Digital Mentor: Globarena, Hyderabad,2005
2. Sky Pronunciation Suite: Young India Films, Chennai,2009
3. Mastering English in Vocabulary, Grammar, Spelling, Composition, Dorling Kindersley, USA, 2001
4. Dorling Kindersley Series of Grammar, Punctuation, Composition, USA, 2001
5. Oxford Talking Dictionary, The Learning Company, USA, 2002
6. Learning to Speak English- 4CDs. The Learning Company, USA, 2002
7. Cambridge Advanced Learners English Dictionary (CD).Cambridge University Press, New Delhi, 2008.

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	02	14-03-2023		TLM4	
2.	Self Introduction & Introducing others	02	21-03-2023 28-03-2023		TLM4	
3.	Self Introduction & Introducing others	02	04-04-2023 11-04-2023		TLM4	
4.	JAM- I(Short and Structured Talks)	02	18-04-2023		TLM4	
5.	JAM-II(Short and Structured Talks)	02	25-04-2023		TLM4	
6.	Role Play-I(Formal and Informal)	04	02-05-2023 09-05-2023		TLM4	
7.	Role Play-II (Formal and Informal)	02	23-05-2023		TLM4	
8.	Group Discussion-I (Reporting the discussion)	02	30-05-2023 06-06-2023		TLM4, TLM6	
9.	Group Discussion-II	02	13-06-2023		TLM4, TLM6	
10.	Oral & Poster Presentation	02	20-06-2023 27-06-2023		TLM2, TLM4	
11.	Lab Internal Exam	02	04-07-2023			
<b>No. of classes required to complete Syllabus: 24</b>				<b>No. of classes taken:</b>		

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

## PART-C

### EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Cumulative Internal Examination (CIE): M	15
Semester End Examination (SEE)	35
Total Marks = CIE + SEE	50



## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
<b>PO 6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to 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.

	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>Ms. K. Sridevi</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. B. Samrajya Lakshmi</b>	<b>Dr. A. Ramireddy</b>
<b>Signature</b>				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF FRESHMAN ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr. V.Parvathi

Course Name & Code : Applied Chemistry Lab & 20FE52

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

Program/Sem/Sec : B.Tech/I-sem/EEE-A

Credits: 1.5

A.Y. : 2022-23

Pre requisites: Nil

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

**Course Outcomes:** At the end of the course, the students will be able to

**CO1:** Assess quality of water based on the given procedures (Understand-L2)

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

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

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

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

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

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

**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 Lab Manual**

## Part-B

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

S. No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Applied chemistry lab, safety measures in lab.	3	18.3.2023		TLM2	CO4	
2.	Introduction and Glassware Preparation of Bakelite	3	25.3.2023		TLM2	CO3,CO4	
3.	Preparation of nylon fibres	3	01.4.2023		TLM4	CO3,CO4	
4.	Determination of amount of Na <sub>2</sub> CO <sub>3</sub> using standard HCl solution	3	08.4.2023		TLM4	CO3,CO4	
5.	Determination of alkalinity of water sample	3	15. .4.2023		TLM4	CO1, CO4	
6.	Determination of total Hardness of water using EDTA method	3	29.4.2023		TLM4	CO1, CO4	
7.	Determination of permanent hardness of using EDTA method	3	06.05.2023		TLM4	CO1, CO4	
8.	Estimation of Mohr's salt using standard KMnO <sub>4</sub>	3	20.05.2023		TLM4	CO2,CO4	
9.	Estimation of Mohr's salt using standard K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	3	27.05.2023		TLM4	CO2,CO4	
10.	Nephelometry	3	03.06.2023		TLM4	CO1,CO4	
11.	Review/Revision of expts.	3	10 .06.2023		TLM4	CO2,CO4	
12.	Review/Revision of expt.	3	17.06.2023		TLM4	CO2,CO4	
13.	Additional Expt.	3	24.06.2023		TLM4	CO2,CO4	
14.	Additional Expt.	3	01.07.2023		TLM4	CO2,CO4	
15.	Internal Lab Exam	3	08.07.2023		TLM4	CO2,CO4	
Total							

#### Teaching Learning Methods

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

### Part - C

#### EVALUATION PROCESS:

According to academic regulations of R20, distribution and weightage of marks for laboratory courses are followed as given below.

#### (a) Continuous Internal Evaluation (CIE):

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

Parameter		Marks
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
<b>Total</b>		<b>15 Marks</b>

#### PROGRAMME OUTCOMES (POs):

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

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamental, 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.

<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. V. Parvathi	Dr. V. Parvathi	Dr. V. Parvathi	Dr. A. Rami Reddy
<b>Signature</b>				



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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF FRESHMAN ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr. V.Parvathi

Course Name & Code : Applied Chemistry Lab & 20FE52

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

Program/Sem/Sec : B.Tech/I-sem/EEE-B

Credits: 1.5

A.Y. : 2022-23

Pre requisites: Nil

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

**Course Outcomes:** At the end of the course, the students will be able to

**CO1:** Assess quality of water based on the given procedures (Understand-L2)

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

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

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

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

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

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

**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 Lab Manual**

## Part-B

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

S. No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Applied chemistry lab, safety measures in lab	3	15.3.2023		TLM2	CO4	
2.	Introduction and Glassware Preparation of Bakelite	3	29.3.2023		TLM2	CO3,CO4	
3.	Preparation of nylon fibres	3	12.4.2023		TLM4	CO3,CO4	
4.	Determination of amount of Na <sub>2</sub> CO <sub>3</sub> using standard HCl solution	3	19.4.2023		TLM4	CO3,CO4	
5.	Determination of alkalinity of water sample	3	26.4.2023		TLM4	CO1, CO4	
6.	Determination of total Hardness of water using EDTA method	3	03.5.2023		TLM4	CO1, CO4	
7.	Determination of permanent hardness of using EDTA method	3	17.05.2023		TLM4	CO1, CO4	
8.	Estimation of Mohr's salt using standard KMnO <sub>4</sub>	3	24.05.2023		TLM4	CO2,CO4	
9.	Estimation of Mohr's salt using standard K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	3	31.05.2023		TLM4	CO2,CO4	
10.	Nephelometry	3	07.06.2023		TLM4	CO1,CO4	
11.	Review/Revision of expt.	3	14.06.2023		TLM4	CO2,CO4	
12.	Review/Revision of expt.	3	21.06.2023		TLM4	CO2,CO4	
13.	Additional Expt.	3	28.06.2023		TLM4	CO2,CO4	
14.	Internal Lab Exam	3	05.07.2023		TLM4	CO2,CO4	
Total							

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:

According to academic regulations of R20, distribution and weightage of marks for laboratory courses are followed as given below.

#### (a) Continuous Internal Evaluation (CIE):

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

Parameter		Marks
Day - to - Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
<b>Total</b>		<b>15 Marks</b>

### PROGRAMME OUTCOMES (POs):

#### Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamental, 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.
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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.

<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. V. Parvathi	Dr. V. Parvathi	Dr. V. Parvathi	Dr. A. Rami Reddy
<b>Signature</b>				



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Phone: 08659-222933, Fax: 08659-222931

**DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING**

## COURSE HANDOUT

### PART-A

Name of Course Instructor	: Dr.B.Pangedaiiah, Mrs R.Padma,Mrs.K.S.L.Lavanya
Course Name & Code	: Programming for Problem Solving Using C Lab (20CS51)
L-T-P Structure	: 0-0-3 Credits : 1.5
Program/Sem/Sec	: B.Tech. –EEE / II Sem /A sec A.Y.: 2022-23

#### **PRE-REQUISITE:Programming and Problem-Solving Skills**

**COURSE EDUCATIONAL OBJECTIVE (CEO):**The objective of the course is to learn the basic elements of CProgramming Structures like Data Types, Expressions, Control Statements, andVarious I/OFunctions and to solve simple mathematical problems using control structures.Design andimplementation of various software components, which solve real world problems.

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

<b>CO1:</b>	Apply control structures of C in solving computational problems.	Apply – Level 3
<b>CO2:</b>	Implement derived data types & use modular programming in problem solving	Apply – Level 3
<b>CO3:</b>	Implement user defined data types and perform file operations.	Apply – Level 3
<b>CO4:</b>	Improve individual / teamwork skills, communication & report writing skills with ethical values.	---

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Module 1: Introduction to Raptor Tool	06	16/03/2023 & 23/03/2023		DM5
2.	Module 2: Problem solving using Raptor Tool				DM5
3.	Module 3: Exercise Programs on Basics of C-Program	03	6/04/2023		DM5
4.	Module 4: Exercise Programs on Control Structures	03	13/04/2023		DM5
5.	Module 5: Exercise Programs on Loops & nesting of Loops	06	20/04/2023 & 27/04/2023		DM5
6.	Module 6: Exercise Programs on Arrays & Strings	06	4/05/2023 & 18/05/2023		DM5
7.	Module 7: Exercise Programs on Pointers	03	25/05/2023		DM5
8.	Module 8: Exercise Programs on Functions	03	1/06/2023		DM5
9.	Module 9: Exercise Programs on user defined data types	03	8/06/2023		DM5
10.	Module 10: Exercise Programs on Files	03	15/06/2023		DM5
11.	Practice Programs	03	22/06/2022		DM5
12.	Internal Test	03	06/07/2022		DM4

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

## **PART-C**

### **EVALUATION PROCESS (R20 Regulations):**

Evaluation Task	Marks
Day – Day Evaluation	A=05
Record	B=05
Internal Exam	C=05
Cumulative Internal Examination (CIE) : A+B+C	15
Semester End Examination (SEE)	35
Total Marks = CIE + SEE	50

### **ACADEMIC CALENDER:**

<b>B.Tech (II Semester)</b>			
Commencement of Class Work	<b>13-03-2023</b>		
I Phase of Instructions	13-03-2023	06-05-2023	8 W
I MID Examinations	<b>08-05-2023</b>	<b>13-05-2023</b>	<b>1 W</b>
II Phase of Instructions	15-05-2023	08-07-2023	8 W
II MID Examinations	<b>10-07-2023</b>	<b>15-07-2023</b>	<b>1 W</b>
Preparation and Practicals	17-07-2023	22-07-2023	1 W
Semester End Examinations	<b>24-07-2023</b>	<b>05-08-2023</b>	<b>2 W</b>
Commencement of Next Semester Class Work	<b>07-08-2023</b>		

## PART-C

### PROGRAMME OUTCOMES (POs):

<b>PO1</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>PO2</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>PO3</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>PO4</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>PO6</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
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<b>PO10</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.
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<b>PO12</b>	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

<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.B.Pangedaiah Mrs R.Padma Mrs.K.Lavanya	Dr. M. SrinivasaRao	Dr. Y.V. BhaskarReddy	Dr.J.Siva Vara Prasad
<b>Signature</b>				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

**DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING**

## COURSE HANDOUT

### PART-A

Name of Course Instructor	: Mrs R.Padma ,Dr.B.Pangedaiah, ,Mrs.K.S.L.Lavanya
Course Name & Code	: Programming for Problem Solving Using C Lab (20CS51)
L-T-P Structure	: 0-0-3 Credits : 1.5
Program/Sem/Sec	: B.Tech. –EEE / II Sem /B sec A.Y.: 2022-23

#### **PRE-REQUISITE: Programming and Problem-Solving Skills**

**COURSE EDUCATIONAL OBJECTIVE (CEO):**The objective of the course is to learn the basic elements of C Programming Structures like Data Types, Expressions, Control Statements, and Various I/O Functions and to solve simple mathematical problems using control structures. Design and implementation of various software components, which solve real world problems.

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

<b>CO1:</b>	Apply control structures of C in solving computational problems.	Apply – Level 3
<b>CO2:</b>	Implement derived data types & use modular programming in problem solving	Apply – Level 3
<b>CO3:</b>	Implement user defined data types and perform file operations.	Apply – Level 3
<b>CO4:</b>	Improve individual / teamwork skills, communication & report writing skills with ethical values.	---

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Module 1: Introduction to Raptor Tool	06	18/03/2023 & 25/03/2023		DM5
2.	Module 2: Problem solving using Raptor Tool				DM5
3.	Module 3: Exercise Programs on Basics of C-Program	03	1/04/2023		DM5
4.	Module 4: Exercise Programs on Control Structures	03	15/04/2023		DM5
5.	Module 5: Exercise Programs on Loops & nesting of Loops	03	29/04/2023		DM5
6.	Module 6: Exercise Programs on Arrays & Strings	06	6/05/2023 & 20/05/2023		DM5
7.	Module 7: Exercise Programs on Pointers	03	27/05/2023		DM5
8.	Module 8: Exercise Programs on Functions	03	3/06/2023		DM5
9.	Module 9: Exercise Programs on user defined data types	03	17/06/2023		DM5
10.	Module 10: Exercise Programs on Files	03	24/06/2023		DM5
12.	Internal Test	03	01/07/2023		DM4

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

## PART-C

### **EVALUATION PROCESS (R20 Regulations):**

Evaluation Task	Marks
Day – Day Evaluation	A=05
Record	B=05
Internal Exam	C=05
Cumulative Internal Examination (CIE) : A+B+C	15
Semester End Examination (SEE)	35
Total Marks = CIE + SEE	50

### **ACADEMIC CALENDER:**

<b>B.Tech (II Semester)</b>			
Commencement of Class Work	<b>13-03-2023</b>		
I Phase of Instructions	13-03-2023	06-05-2023	8 W
I MID Examinations	<b>08-05-2023</b>	<b>13-05-2023</b>	<b>1 W</b>
II Phase of Instructions	15-05-2023	08-07-2023	8 W
II MID Examinations	<b>10-07-2023</b>	<b>15-07-2023</b>	<b>1 W</b>
Preparation and Practicals	17-07-2023	22-07-2023	1 W
Semester End Examinations	<b>24-07-2023</b>	<b>05-08-2023</b>	<b>2 W</b>
Commencement of Next Semester Class Work	<b>07-08-2023</b>		



## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO1</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>PO2</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>PO3</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>PO4</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>PO5</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>PO6</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>PO7</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>PO8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</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>PO10</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>PO11</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>PO12</b>	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs R.Padma Dr.B.Pangedaiah Mrs.K.Lavanay	Dr. M. SrinivasaRao	Dr. Y.V. BhaskarReddy	Dr.J.Siva Vara Prasad
Signature				



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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 MECHANICAL ENGINEERING

## COURSE HANDOUT

### PART-A

<b>PROGRAM</b>	: B.Tech., II-Sem., EEE-A/S
<b>ACADEMIC YEAR</b>	: 2021-22
<b>COURSE NAME &amp; CODE</b>	: COMPUTER AIDED ENGINEERING GRAPHICS LAB 20ME53
<b>L-T-P STRUCTURE</b>	: 1-0-2
<b>COURSE CREDITS</b>	: 2
<b>COURSE INSTRUCTOR</b>	: A NAGESWARA RAO/ V SANKARA RAO/ P Mounika Reddy
<b>COURSE COORDINATOR</b>	: KOTHARI VENKATA VISWANADH
<b>PRE-REQUISITE</b>	: ENGINEERING GRAPHICS

### **COURSE EDUCATIONAL OBJECTIVE:**

The main objectives of this course are to familiarize various commands used in Auto-CAD and to visualize the isometric and orthographic views of any solid object.

### **COURSE OUTCOMES:**

After completion of the course students are the able to:

CO1: Understand the Auto-CAD basics and apply to solve practical problems used in industries where the speed and accuracy can be achieved.

CO2: Understand the principle of Orthographic projections of points, lines, planes and solids.

CO3: Familiarize with the sectioning of solids and development of surfaces.

CO4: Convert orthographic to isometric vice versa.

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

17ME62 CAEG Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					3	3						2	1	3	3
CO2	3				3	2						2		2	2
CO3	3				3							2			
CO4	3				3							2		2	2

### **MATERIAL:**

M1 Lab Manual

### **REFERENCES:**

1. M. Kulkarni, A.P Rastogi, and A.K. Sarkar, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, 2009.
2. Bethune, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, 2009.
3. N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar

**COURSE DELIVERY PLAN (LESSON PLAN): PART-B 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	Text Book followed	HOD Sign Weekly
1.	Introduction	03	15/03/2023		TLM8	CO1	M1	
2.	Basic drawing commands	03	29/03/2023		TLM8	CO 1	M1	
3.	Edit commands	03	12/03/2023		TLM8	CO1	M1	
4.	Array commands	03	19/04/2023		TLM8	CO1	M1	
5.	Hatching & line commands	03	26/04/2023		TLM8	CO1	M1	
6.	Mirror & Trim commands	03	03/05/2023		TLM8	CO2	M1	
7.	Dimensioning & Text commands	03	10/05/2023		TLM8	CO2	M1	
8.	Projection of points	03	17/05/2023		TLM8	CO2	M1	
9.	Projection of lines	03	24/05/2023		TLM8	CO2	M1	
10.	<b>Orthographic projections:</b> Conversion of plane figures	03	31/05/2023		TLM8	CO3	M1	
11.	Conversion of circular figures	03	07/06/2023		TLM8	CO3	M1	
12.	Conversion of both plane & circular figures	03	14/06/2023		TLM8	CO3	M1	
13.	<b>Isometric projections:</b> Conversion of plane figures	03	21/06/2023		TLM8	CO4	M1	
14.	Conversion of circular figures	03	28/06/2023		TLM8	CO4	M1	
15.	Repetition	03	05/07/2023		TLM8	CO1	M1	

No. of classes required to complete	45			No. of classes taken:
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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

### PROGRAMME EDUCATIONAL OBJECTIVES:

<b>PEO 1</b>	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
<b>PEO 2</b>	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
<b>PEO 3</b>	To develop inquisitiveness towards good communication and lifelong learning.

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

<b>PSO 1</b>	To apply the principles of thermal sciences to design and develop various thermal systems.
<b>PSO 2</b>	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HoD</b>
ANR/VSR/PMR	Mr.K.V.Viswanadh	Mr. B. Sudheer Kumar	Dr.S.Pichi Reddy



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DEPARTMENT OF MECHANICAL ENGINEERING

## COURSE HANDOUT

### PART-A

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<b>ACADEMIC YEAR</b>	: 2021-22
<b>COURSE NAME &amp; CODE</b>	: COMPUTER AIDED ENGINEERING GRAPHICS LAB 20ME53
<b>L-T-P STRUCTURE</b>	: 1-0-2
<b>COURSE CREDITS</b>	: 2
<b>COURSE INSTRUCTOR</b>	: A.Dhanunjay Kumar/ A.Prathyush/S.Uma Maheswara Reddy
<b>COURSE COORDINATOR</b>	: KOTHARI VENKATA VISWANADH
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The main objectives of this course are to familiarize various commands used in Auto-CAD and to visualize the isometric and orthographic views of any solid object.

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After completion of the course students are the able to:

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17ME62 CAEG Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					3	3						2	1	3	3
CO2	3				3	2						2		2	2
CO3	3				3							2			
CO4	3				3							2		2	2

### **MATERIAL:**

M1 Lab Manual

### **REFERENCES:**

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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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5.	Hatching & line commands	03	28/04/2023		TLM8	CO1	M1	
6.	Mirror & Trim commands	03	05/05/2023		TLM8	CO2	M1	
7.	Dimensioning & Text commands	03	19/05/2023		TLM8	CO2	M1	
8.	Projection of points	03	26/05/2023		TLM8	CO2	M1	
9.	Projection of lines	03	02/06/2023		TLM8	CO2	M1	
10.	<b>Orthographic projections:</b> Conversion of plane figures	03	09/06/2023		TLM8	CO3	M1	
11.	Conversion of circular figures	03	16/06/2023		TLM8	CO3	M1	
12.	Conversion of both plane & circular figures	03	23/06/2023		TLM8	CO3	M1	
13.	<b>Isometric projections:</b> Conversion of plane figures	03	30/06/2023		TLM8	CO4	M1	
14.	Conversion of circular figures	03	07/07/2023		TLM8	CO4	M1	
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<b>No. of classes required to complete</b>		<b>45</b>			<b>No. of classes taken:</b>			

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<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HoD</b>
ADK/AP/SUR	Mr.K.V.Viswanadh	Mr. B. Sudheer Kumar	Dr.S.Pichi Reddy