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

Name of Course Instructor: Dr Pawel Veliventi
Course Name & Code : Professional Communication-I (20FE01)
L-T-P Structure : 2-0-0 **Credits:** 2
Program/Sem/Sec : ME/I/A **A.Y.:** 2021-22
PREREQUISITE: Nil

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

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

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

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

TEXTBOOKS:

T1 Prabhavati.Y & etal, "English All Round–Communication Skills for Undergraduate Learners", Orient BlackSwan, Hyderabad, 2019

T2 "The Great Indian Scientists", Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

R1 Swan,M., "Practical English Usage", Oxford University Press, 2016

R2 Kumar,S and Latha, P, "Communication Skills", Oxford University Press, 2018

R3 Rizvi Ashraf M.,"Effective Technical Communication",TataMcGrawHill, NewDelhi, 2008

R4 Baradwaj Kumkum, "Professional Communication" ,I.K.International Publishing House Pvt. Lt.d, NewDelhi, 2008

R5 Wood, F.T., "Remedial English Grammar", Macmillan, 2007

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Exploration

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.	A Proposal to Girdle the Earth	2	13-12-21 & 16-12-21		TLM1	
2.	Skimming and Scanning	1	17-12-21		TLM1	
3.	Content & Function Words	1	20-12-21		TLM2	
4.	Verbs, Nouns, Adjectives and Adverbs	1	23-12-21		TLM2	
5.	Countable and Uncountable Nouns	1	27-12-21		TLM3	
6.	Singular and Plural Nouns	1	30-12-21		TLM1	
7.	Wh-Questions, Word Order in Sentences	1	31-12-21		TLM2	
8.	Paragraph Analysis & Writing	1	3-1-22		TLM1	
9.	Punctuation and Capital Letters	1	6-1-22		TLM1	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: On Campus

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.	The District School as it was by One Who Went to it	2	7-1-22 & 11-1-22		TLM1	
11.	Identifying Sequence of Ideas	1	17-1-22		TLM1	
12.	Cohesive Devices: Linkers/Signposts/Transition Signals	1	20-1-22		TLM3	
13.	Synonyms	1	21-1-22		TLM2	
14.	Meanings of Words/Phrases in the Context	1	24-1-22		TLM1	
15.	Memo Drafting	1	27-1-22		TLM2	
No. of classes required to complete UNIT-II: 7				**No. of classes taken:**		

UNIT-III: Working Together

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.	The Future of Work	1	28-1-22		TLM1	
17.	Making Basic Inferences	1	7-2-22		TLM1	
18.	Strategies to Use Text Clues for Comprehension	1	10-2-22		TLM2	
19.	Tenses	2	11-2-22 & 14-2-22		TLM2	
20.	Reporting Verbs for Academic Purposes	1	17-2-22		TLM1	
21.	Rephrasing	1	18-2-22		TLM3	
22.	Avoiding Redundancies and Repetitions	1	21-2-22		TLM2	
23.	Summarizing/Abstract Writing	1	24-2-22		TLM1	
No. of classes required to complete UNIT-III: 9				**No. of classes taken:**		

UNIT-IV: APJ Abdul Kalam

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	APJ Abdul Kalam	2	25-2-22 & 28-2-22		TLM1	
25.	Direct & Indirect Speech	2	3-3-22		TLM1	
26.	Articles	2	4-3-22 & 7-3-22		TLM3	
27.	e-mail Drafting	1	10-3-22		TLM1	
No. of classes required to complete UNIT-IV:7				**No. of classes taken:**		

UNIT-V: C.V.Raman

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.	C.V.Raman	2	11-3-22 & 14-3-22		TLM1	
29.	Subject-Verb Agreement	1	17-3-22		TLM2	
30.	Prepositions	1	21-3-22		TLM2	
31.	Formal Letter Writing	2	24-3-22 & 25-3-22		TLM3	
No. of classes required to complete UNIT-V: 6				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems
PSO 2	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
PSO 3	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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr Pawel Veliventi**	**Dr B Samrajya Lakshmi**	**Dr B Samrajya Lakshmi**	**Dr A Ramireddy**
Signature				

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DEPARTMENT OF MECHNICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: G.VIJAYA LAKSHMI
Course Name & Code : Differential Equations&20FE03
L-T-P Structure : 3-2 -0 **Credits:4**
Program/Sem/Sec : I B.Tech/I sem/A **A.Y.:** 2021 - 22

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is to introduce the first order and higher order differential equations, functions of several variables. The students will also learn solving of first order partial differential equations.

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

CO1	Apply first order and first degree differential equations to find orthogonal trajectories.
CO2	Distinguish between the structure and methodology of solving higher order differential equations with constant coefficients.
CO3	Apply various Numerical methods to solve initial value problem.
CO4	Generate the infinite series for continuous functions and investigate the functional dependence.
CO5	Solve partial differential equations using Lagrange's method.

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

R4 S. S. Sastry, " Introductory Methods of Numerical Analysis" 5th Edition, PHI Learning Private Limited, New Delhi, 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Ordinary Differential Equations of first order and first degree

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	15/12/2021		TLM1	
2.	Introduction to UNIT I	1	16/12/2021		TLM1	
3.	Formation of Differential Equations	1	17/12/2021		TLM1	
4.	Exact DE	1	17/12/2021		TLM1	
5.	Non-exact DE Type I	1	18/12/2021		TLM1	
6.	Non-exact DE Type II	1	22/12/2021		TLM1	
7.	Non-exact DE Type III	1	23/12/2021		TLM1	
8.	**TUTORIAL 1**	1	24/12/2021		TLM3	
9.	Non-exact DE Type IV	1	24/12/2021		TLM1	
10.	Orthogonal Trajectories (Cartesian)	1	29/12/2021		TLM1	
11.	Orthogonal Trajectories (polar)	1	30/12/2021		TLM1	
12.	Orthogonal Trajectories (polar)	1	31/12/2021		TLM1	
13.	Problems	1	31/12/2021		TLM1	
14.	**TUTORIAL 2**	1	5/01/2022		TLM3	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II: Linear Differential Equations of Higher Order

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.	Introduction to UNIT II	1	6/01/2021		TLM2	
16.	Solving a homogeneous DE	1	07/01/2022		TLM1	
17.	Finding Particular Integral, P.I for e^{ax+b}	1	07/01/2022		TLM1	
18.	P.I for Cos bx, or sin bx	1	08/01/2022		TLM1	
19.	P.I for Cos bx, or sin bx		12/01/2022			
20.	P.I for polynomial function	1	19/01/2022		TLM1	
21.	P.I for $e^{ax+b}v(x)$	1	20/01/2022		TLM1	
22.	P.I for $e^{ax+b}v(x)$	1	21/01/2022		TLM1	
23.	P.I for $x^k v(x)$	1	21/01/2022		TLM1	
24.	P.I for $x^k v(x)$		22/01/2022		TLM1	
25.	**TUTORIAL 3**	1	27/01/2022		TLM3	
26.	Method of Variation of parameters	1	28/01/2022		TLM1	
27.	Method of Variation of parameters	1	28/01/2022		TLM1	
28.	**TUTORIAL 4**	1	29/01/2022		TLM3	
No. of classes required to complete UNIT-II: 14				**No. of classes taken:**		

UNIT-III: Numerical Solution of Ordinary Differential 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
29.	Introduction to Unit-III	1	02//02/2022		TLM1	
30.	Solution by Taylor's series	1	03/02/2022		TLM1	
31.	Solution by Taylor's series	1	04/02/2022		TLM1	
32.	Picard's Method	1	04/02/2022		TLM1	
33.	Picard's Method	1	05/02/2022		TLM1	
34.	**TUTORIAL 5**	1	16/02/2022		TLM3	
35.	Euler's Method	1	17/02/2022		TLM1	
36.	REVISION	1	18/02/2022		TLM1	
37.	Modified Euler's Method	1	18/02/2022		TLM 1	
38.	Modified Euler's Method	1	19/02/2022		TLM1	
39.	Runge- Kutta Method	1	23/02/2022		TLM1	
40.	Runge- Kutta Method	1	24/02/2022		TLM1	
41.	Problems	1	25/02/2022		TLM1	
42.	**TUTORIAL 6**	1	25/02/2022		TLM3	
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: Functions of Several variables

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction to UNIT IV	1	26/02/2022		TLM1	
44.	Generalized Mean Value Theorem, Taylor's series	1	02/03/2022		TLM1	
45.	Maclaurin's series	1	03/03/2022		TLM1	
46.	Maclaurin's series	1	04/03/2022		TLM1	
47.	Functions of several variables	1	04/03/2022		TLM1	
48.	**TUTORIAL 7**	1	05/03/2022		TLM3	
49.	Jacobians (polar, cylindrical, spherical coordinates)	1	09/03/2022		TLM1	
50.	Jacobians (polar, cylindrical, spherical coordinates)	1	10/03/2022		TLM1	
51.	Functional dependence	1	11/03/2022		TLM1	
52.	Maxima and Minima of functions of two variables	1	11/03/2022		TLM1	
53.	Maxima and Minima of functions of two variables	1	12/03/2022		TLM1	
54.	Maxima and Minima of functions of two variables	1	16/03/2022		TLM1	
55.	**TUTORIAL 8**	1	17/03/2022		TLM3	
No. of classes required to complete UNIT-IV:13				**No. of classes taken:**		

UNIT-V: Partial Differential 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
56.	Introduction to UNIT V	1	19/03/2022		TLM1	
57.	Formation of PDE by elimination of arbitrary constants	1	23/03/2022		TLM1	
58.	Formation of PDE by elimination of arbitrary constants	1	24/03/2022		TLM1	
59.	Formation of PDE by elimination of arbitrary functions	1	25/03/2022		TLM1	
60.	Formation of PDE by elimination of arbitrary functions	1	25/03/2022		TLM1	

61.	Formation of PDE	1	26/03/2022		TLM1	
62.	**TUTORIAL 9**	1	30/03/2022		TLM3	
63.	Solving of PDE	1	31/03/2022		TLM1	
64.	Lagrange's Method	1	01/04/2022		TLM1	
65.	**TUTORIAL 10**	1	01/04/2022		TLM3	
66.						
67.						
68.						
69.						
70.						
No. of classes required to complete UNIT-V: 15				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**G.Vijaya Lakshmi**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Lakshmi V R Babu Syamala
Course Name & Code : Applied Chemistry & 20FE05
L-T-P Structure : 3-0-0 **Credits:** 03
Program/Sem/Sec : B.Tech/I-sem/ME-A **A.Y. :** 2021-22

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 applica (Understand-L2)
CO2	Identify issues issues related to conventional fuels, biofuels and photo-voltaic cells in e 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 / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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
1 = Slight (Low)			**2 = Moderate (Medium)**					**3 = Substantial (High)**				

BOS APPROVED TEXT BOOKS:

TEXT BOOKS

1. Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.

2. Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16th Edition, 2015.

REFERENCES

1. Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015.
2. S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010.
3. Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1st 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.	Introduction to Applied Chemistry, Sources of water & quality	1	13-12-2021		TLM1	
2.	Hardness & types of hardness, Units of hardness & interrelation	1	14-12-2021		TLM1	
3.	Problems on hardness-1	1	16-12-2021		TLM1	
4.	Problems on hardness-2	1	17-12-2021		TLM1	
5.	Scale and sludges, Caustic embrittlement	1	20-12-2021		TLM1	
6.	priming and foaming, Bolier corrosion	1	21-12-2021		TLM1	
7.	W.H.O standards of potable water, Ion exchange process	1	23-12-2021		TLM1	
8.	Reverse osmosis and electro-dialysis	1	24-12-2021		TLM2	
9.	Treatment of industrial waste water	1	27-12-2021		TLM1	
10.	Revision	1	30-12-2021		TLM1	
11.	Assignment & Quiz					
No. of classes required to complete UNIT-I: 11				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	31-12-2021		TLM1	
2.	GCV, LCV and coal origin	1	3-1-2022		TLM1	
3.	Proximate Analysis & significance	1	4-1-2022		TLM1	
4.	Petroleum-origin, types of crude oil and refining of petroleum	1	6-1-2022		TLM2	
5.	Cracking - moving bed	1	7-1-2022		TLM2	

	catalytic cracking, synthetic petrol –Fischer Tropsch's process					
6.	Natural gas composition and C.N.G - advantages	1	10-1-2022		TLM1	
7.	Characteristics of bio fuels, sources of bio mass & advantages - Production of biodiesel from rape seed oil	1	11-1-2022		TLM1	
8.	Photovoltaic cell design working, advantages and disadvantages	1	18-1-2022		TLM2	
9.	Revision	1	20-1-2022		TLM1	
10.	Assignment and Quiz	1	21-1-2022			
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 Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to electrochemistry	1	24-1-2022		TLM1	
2.	Types of electrodes, Calomel Electrode	1	25-1-2022		TLM2	
3.	Glass Electrode	1	27-1-2022		TLM2	
4.	Calculation of EMF of Cell	1	28-1-2022		TLM1	
5.	Applications of Electro chemical Series, Applications of Nernst Equation-1	1	31-1-2022		TLM1	
6.	Applications of Nernst Equation-2	1	1-2-2022		TLM1	
7.	Lead-acid Battery	1	3-2-2022		TLM2	
8.	Lithium ion Battery	1	4-2-2022		TLM2	
9.	H_2– O_2 Fuel Cell, Mg-Cu reserve battery	1	14-2-2022		TLM2	
10.	Revision, Assignment & Quiz	1	17-2-2022		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.	Types of dry corrosion-oxidative corrosion, Pilling Bed worth rule	1	18-2-2022		TLM1	
2.	corrosion by other gases and liquid metal corrosion	1	21-2-2022		TLM1	
3.	Wet corrosion, mechanism	1	22-2-2022		TLM1	
4.	Concentration Cell Corrosion	1	24-2-2022		TLM2	
5.	Passivity and Galvanic series	1	25-2-2022		TLM1	
6.	Nature of metal that influences rate of corrosion	1	28-2-2022		TLM1	
7.	Nature of environment	1	3-3-2022		TLM1	

8.	Cathodic Protection	1	4-3-2022		TLM2	
9.	electro plating and metal cladding	1	7-3-2022		TLM2	
10.	Revision, Assignment & Quiz	1	8-3-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				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	10-3-2022		TLM1	
2.	Preparation properties and engineering applications of PVC, Teflon, BUNA-S and Polyurethane.	1	11-3-2022		TLM2	
3.	Preparation properties and engineering applications of BUNA-S and Polyurethane	1	14-3-2022		TLM2	
4.	Characteristics of a good lubricant and properties of lubricants; Application of properties of lubricants	1	15-3-2022		TLM1	
5.	Nano Materials Introduction, definition, extraordinary changes observed at nano size of materials and reasons	1	17-3-2022		TLM2	
6.	Types of nano-materials, Gas-Phase synthesis & Applications	1	21-3-2022		TLM2	
7.	Composites, advantageous characteristics of composites, Constituents	1	22-3-2022		TLM1	
8.	Fibre reinforced composites (GFRP, CFRP), Reasons for failure of composites	1	24-3-2022		TLM1	
9.	Revision, Assignment , Quiz	1	25-3-2022		TLM1	
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PART-A

Name of Course Instructor: T.Nagadurga
Course Name & Code : Basic Electrical and Electronics Engineering-20EE02
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech., I-Sem., ME – A section
A.Y.: 2020-21

PREREQUISITE: None

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This course enables student to illustrate the basics of applied electricity and electronics.

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

CO1	CO1: Apply network reduction techniques to simplify electrical circuits
CO2	CO2: Illustrate the working principle of DC machines and transformers
CO3	CO3: Understand V-I characteristics of semiconductor devices.
CO4	CO4: Illustrate the configuration of Transistors and their applications

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

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

TEXTBOOKS:

T1. A.Sudhakar and Shyammohan S Palli, Electrical Circuits, Tata McGraw-Hill, 3rd Edition.

T2. M.S.Sukhija, T.K.Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford University Press, 2016 Edition.

REFERENCE BOOKS:

R1: Kothari and Nagarath, "Basic Electrical Engineering", TMH Publications, 3rd Edition.2013

R2: G.S.N.Raju, "Electronic Devices and Circuits", I.K.International.2006

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - B

UNIT-I: ELECTRICAL CIRCUIT FUNDAMENTALS

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	1	13/12/21		TLM1	
2.	Basic definitions	1	14/12/21		TLM1	
3.	Types of elements	1	15/12/21		TLM1	
4.	R,L,C parameters	1	17/12/21		TLM1	
5.	Ohm's Law, Kirchhoff's Laws	1	20/12/21		TLM1	
6.	Series & parallel Star to delta, Delta to star	1	21/12/21		TLM1	
7.	Source transformations	1	22/12/21		TLM1	
8.	Mesh Analysis	1	24/12/21		TLM2	
9.	Nodal Analysis	1	27/12/21		TLM2	
10.	Assignment/Quiz-I	1	28/12/21		TLM6	
11.	Problems	1	29/12/21			
12.	Problems	1	31/12/21			
No. of classes required to complete UNIT-I		12	4/1/22			

UNIT-II : AC FUNDAMENTALS and NETWORK THEOREMS

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.	Superposition Theorem	1	5/1/22		TLM1	
2.	Thevenin's Theorem	1	7/1/22		TLM1	
3.	Norton's Theorem	1	10/1/22		TLM1	
4.	Maximum Power Transfer Theorem	1	11/1/22		TLM1	
5.	Peak, R.M.S,	1	17/1/22		TLM1	

	average and instantaneous values					
6.	Form factor and Peak factor for periodic waveforms Phase and Phase difference	1	18/1/22		TLM1	
7.	Reactance, Impedance, Susceptance and Admittance	1	19/1/22		TLM1	
8.	Real, Reactive and apparent Powers, Power factor	1	21/1/22		TLM1	
9.	Resonance	1	24/1/22		TLM2	
10.	Band Width & Quality Factor	1	25/1/22		TLM1	
11.	Problems	1	26/1/22		TLM1	
12.	Assignment/Quiz-II	1	28/1/22		TLM6	
No. of classes required to complete UNIT-II		12				

UNIT-III : DC Machine Fundamentals and Single Phase Transformers

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 Electrical Machine	1	7/2/22		TLM1	
14.	DC generator principle	1	8/2/22		TLM1	
15.	constructional details	1	9/2/22		TLM1	
16.	EMF equation	1	11/2/22		TLM1	
17.	types of generators	1	14/2/22		TLM1	
18.	DC motor principle, Back emf	1	15/2/22		TLM1	
19.	types of motors motor applications	1	16/2/22		TLM2	
20.	Principle of operation of single phase transformers	1	18/2/22		TLM1	
21.	Construction of single phase transformers	1	21/2/22		TLM2	
22.	EMF equation of Transformer	1	22/2/22		TLM2	
23.	Assignment/Quiz-III	1	23/2/22		TLM6	
24.	Problems	1	25/2/22		TLM1	
25.	Problems	1	28/2/22		TLM1	
No. of classes required to complete UNIT-III		13				

UNIT-IV : P-N Junction Diode and Zener Diode

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 Electronic Devices	1	1/3/22		TLM1	
27.	Operation of PN junction diode	1	2/3/22		TLM2	
28.	V-I characteristics of PN junction diode	1	4/3/22		TLM2	
29.	Half Wave Rectifier& Full Wave Rectifier-Bridge type	1	7/3/22		TLM1	
30.	Operation of Zener Diode & V-I characteristics of Zener Diode	1	8/3/22		TLM1	
31.	Zener Diode as Voltage Regulator	1	9/3/22		TLM1	
32.	Problems	1	9/3/22		TLM1	
33.	Assignment/Quiz-4	1	11/3/22		TLM6	
No. of classes required to complete UNIT-IV		12				

UNIT-V: Transistors

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 and symbol of Transistor	1	14/3/22		TLM1	
35.	Introduction and symbol of Transistor	1	15/3/22		TLM1	
36.	Principle, Operation and Construction - Transistor	1	16/322		TLM1	
37.	CB configuration	1	18/3/22		TLM1	
38.	CB, CE configuration	1	21/3/22		TLM1	
39.	JFET& MOSFET	1	22/3/22		TLM2	
40.	Application of transistor as an amplifier	1	23/322		TLM2	
41.	Assignment/Quiz-4	1	23/3/22		TLM2	
No. of classes required to complete UNIT-V		13				

CONTENT BEYOND SYLLABUS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods
1	Applications of DC Machines	1	25/3/22		TLM2

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	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	**T.Nagadurga**	Mr.A.V.Ravi Kumar	Dr.G.Nageswara Rao	Dr.J.S.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 FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Lakshmi V R Babu Syamala
Course Name & Code : Applied Chemistry Lab & 20FE52
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/II-sem/ME-A **A.Y. :** 2021-22

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
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus
CO3: Acquire practical knowledge related to preparation of polymers
CO4: Exhibit skills in performing experiments based on theoretical fundamentals.

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; Determination of pH of the given sample solution/soil using pH meter	3	13-12-2021		TLM2	CO4	
2.	Introduction and Glassware explanation; Preparation of Bakelite	3	20-12-2021		TLM2	CO4	
3.	Determination of amount of Na_2CO_3 using standard HCl solution	3	27-12-2021		TLM4	CO2,CO4	
4.	Estimation of Mohr's salt using standard $KMnO_4$	3	03-01-2022		TLM4	CO3,CO4	
5.	Estimation of Mohr's salt using standard $K_2Cr_2O_7$	3	10-01-2022		TLM4	CO4	
6.	Determination of total Hardness of water using EDTA method	3	24-01-2022		TLM4	CO3,CO4	
7.	Determination of permanent hardness of using EDTA method	3	31-01-202		TLM4	CO1,CO4	
8.	Determination of alkalinity of water sample	3	14-02-2022		TLM4	CO1,CO4	
9.	Preparation of nylon fibres	3	21-02-2022		TLM4	CO1,CO4	
10.	Nephelometry	3	28-02-2022		TLM4	CO2,CO4	
11.	Internal Lab Exam	3	21-03-2022		TLM4	CO2,CO4	
Total							

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

Part - C

EVALUATION PROCESS:

According to academic regulations of R20, distribution and weightage of marks for laboratory courses 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
Total		**15 Marks**

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.

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

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.T.Nagadurga, Mr.V.Prabhakar Reddy
Course Name & Code : **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB**
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., MECH., I-Sem., Sections- A A.Y : 2021-22

PRE-REQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):. This lab course enables the student to demonstrate the knowledge of electrical and electronic equipment and analysis of electric circuits. It also deals with plotting characteristics of basic semiconductor devices.

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

CO 1	Examine electrical circuits using network theorems
CO 2	Analyze VI characteristics of semiconductor devices.
CO 3	Analyze electrical circuits.
CO4	Design Resonance circuits.

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

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
3	2		2	2			3	3	3		1			
3	2		2	2			3	3	3		1			
3	2		2	2			3	3	3		1			
3	2		3	2			3	3	3		1			

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

List of Experiments

(Any of the 10 experiments are required to be conducted)

1. V-I relations of passive elements (R, L, C).
2. Verification of Kirchhoff's Laws (KCL and KVL.).
3 Measurement of active power, reactive power and power factor of AC circuits.
4. Calculation of Resonant frequency, Bandwidth and Quality factor of resonant circuits.
5. Verification of Superposition theorem.
6. Verification of Thevenin's and Norton's theorems.
7. Verification of Maximum power transfer theorem.
8. Plot the V-I characteristics of a p-n junction diode.
9. Plot the V-I characteristics of Zener diode.
10. Plot the V-I characteristics of BJT.
11. Calculation of ripple factor and regulation of Full Wave Rectifier with and without filters.
12. Plot the V-I characteristics of MOSFET.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

DAY: Wednesday (4,5,6 Hours) Regd.Nos:

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XV Week
Tentative Date		15/12/21	22/12	29/12	5/1/22	12/1/22	19/1/22	2/2/22	9/2/22	16/2/22	23/2/22	2/3/22	9/3/22	16/3/22	23/3/22
Actual Date															
B-1		Demo	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIM	REVISION OF EXPERIMENTS	TEST
B-2		Demo	2	3	4	5	1	7	8	9	10	6			
B-3		Demo	3	4	5	1	2	8	9	10	6	7			
B-4		Demo	4	5	1	2	3	9	10	6	7	8			
B-5		Demo	5	1	2	3	4	10	6	7	8	9			
B-6		Demo	1	2	3	4	5	6	7	8	9	10			
B-7		Demo	2	3	4	5	1	7	8	9	10	6			
B-8		Demo	3	4	5	1	2	8	9	10	6	7			
B-9		Demo	4	5	1	2	3	9	10	6	7	8			
B-10		Demo	5	1	2	3	4	10	6	7	8	9			

DAY: Saturday (1,2 ,3 Hours)
Roll.Nos:

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week
	Tentative Date	18/12/21	8/1/22	15/1/22	22/1/22	29/1/22	12/2/22	19/2/22	5/3/22	12/3/22	19/3/22	26/3/22
	Actual Date											
B-1		Demo	1	2	3	4	5	6	7	8	9	10
B-2		Demo	1	2	3	4	5	6	7	8	9	10
B-3		Demo	1	2	3	4	5	6	7	8	9	10
B-4		Demo	1	2	3	4	5	6	7	8	9	10
B-5		Demo	1	2	3	4	5	6	7	8	9	10
B-6		Demo	1	2	3	4	5	6	7	8	9	10
B-7		Demo	1	2	3	4	5	6	7	8	9	10
B-8		Demo	1	2	3	4	5	6	7	8	9	10
B-9		Demo	1	2	3	4	5	6	7	8	9	10
B-10		Demo	1	2	3	4	5	6	7	8	9	10

ACADEMIC CALENDAR:

Description	From	To	Weeks
Commencement of class work	6-1-21 to 10-1-21 (Induction Program)		
I phase of Instructions	13-12-2021	29-01-2022	7 W
I Mid Examinations	31-01-2022	5-02-2022	1 W
II Phase of Instructions	7-02-2022	26-03-2022	7 W
II Mid Examinations	28-03-2022	02-04-2022	1 W
Preparation and Practical	04-4-2022	09-4-2022	1 W
Semester End Examinations	11-4-2022	23-04-2022	2 W

PROGRAMME OUTCOMES (POs):

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

T.Nagadurga	Dr.G.Nageswara Rao	Dr.J.Siva Vara Prasad
Course Instructor	**Module Coordinator**	**HOD**

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. I-Sem., ME – A Section

ACADEMIC YEAR : 2021-22

COURSE NAME & CODE : **Engineering Workshop,**

20ME51L-T-P STRUCTURE : 0-0-3

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : P.VIJAY KUMAR /B.UDAYA LAKSHMI/ K.SRINIVAS

COURSE COORDINATOR : Seelam Srinivasa Reddy

PRE-REQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

COURSE OBJECTIVE:

The objective of this course is to get familiarized with various trades used in Engineering Workshop and learn the safety pre-cautions to be followed in the workshops, while working with the different tools.

COURSE OUTCOMES (CO)

CO 1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
CO 2	Fabricate and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
CO 3	Produce various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
CO 4	Perform various basic House Wiring techniques.

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (BATCH-AI)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Programme	3			TLM8	-	
2.	Demonstration	3			TLM8	R1	
3.	Experiment-1	3			TLM8	R1	
4.	Experiment-2	3			TLM8	R1	
5.	Experiment-3	3			TLM8	R1	
6.	Experiment-4	3			TLM8	R1	
7.	Experiment-5	3			TLM8	61	
8.	Experiment-6	3			TLM8	R1	
9.	MID-I Exam						
10.	Experiment-7	3			TLM8	R1	
11.	Experiment-8	3			TLM8	R1	
12.	Demonstration of Forging	3			TLM8	R1	
13.	Demonstration of Tin Smithy & Repetition	3			TLM8	R1	
14.	Lab Internal	3			TLM6		

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (BATCH-A2)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Programme	3			TLM8	-	
2.	Demonstration	3			TLM8	R1	
3.	Experiment-1	3			TLM8	R1	
4.	Experiment-2	3			TLM8	R1	
5.	Experiment-3	3			TLM8	R1	
6.	Experiment-4	3			TLM8	R1	
7.	Experiment-5	3			TLM8	R1	
8.	Experiment-6	3			TLM8	R1	

9.	MID-I Exam						
10.	Experiment-7	3	19-03-2021		TLM8	R1	
11.	Experiment-8	3	26-03-2021		TLM8	R1	
12.	Demonstration of Forging	3	02-04-2021		TLM8	R1	
13.	Demonstration of Tin Smithy	3	09-04-2021		TLM8	R1	
14.	Repetition	3	16-04-2021		TLM8	R1	
15.	Lab Internal	3	23-04-2021		TLM6	-	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
Induction Programme	22-11-2021	11-12-2021	
I Phase of Instructions-1	13-12-2021	05-02-2022	8 W
I Mid Examinations	07-02-2022	12-02-2022	1 W
II Phase of Instructions	4-04-2022	9-04-2022	7 W
II Mid Examinations	04-04-2022	09-04-2022	1 W
Preparation and Practicals	11-04-2022	16-04-2022	1 W
Semester End Examinations	18-04-2022	30-04-2022	2 W

Part - C

EVALUATION PROCESS:

Parameter		Marks
Day – to – Day Work	Observation	A1 = 05 Marks
	Record	A2 = 10 Marks
Internal Test		B =10 Marks
Viva – Voce During Regular Lab Sessions		C = 05 Marks
Cumulative Internal Examination		A1+ A2 + B+C = 30 Marks
Semester End Examinations		D =70 Marks
Total Marks: A1+ A2 + B + C + D		100 Marks

Details of Batches: A-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
A11	21761A0301-307	7	A21	21761A0316-323	8
A12	21761A0308-315	8	A22	21761A0324-331	8

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
A11	C1	C2	F1	F2	P1	P2	E1	E2	D1	D2
A12	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2
A21	C1	C2	F1	F2	P1	P2	E1	E2	D1	D2
A22	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry -1 (C1)-Corner Bridle Joint	CO1
2.	Carpentry -2 (C2)-Dovetail Joint	CO1
3.	Fitting-1 (F1)-T-**J**oint	CO2
4.	Fitting-2 (F2)-V-**J**oint	CO2
5.	Plumbing-1 (P1)-Pipe Threading practice	CO3
6.	Plumbing-2 (P2)-Pipe Layout	CO3
7.	House Wiring-1 (E1) – Series and Parallel connection	CO4
8.	House Wiring-2 (E2) – Fluorescent Lamp and Calling bell Circuit	CO4
9.	Black Smithy (D1)	CO3
10.	Tin Smithy (D2)	CO3

NOTIFICATION OF CYCLE

Cycle	Exp.No.	Name of the Experiment	Related CO
Cycle-1	1.	Carpentry -1 (C1)-Corner Bridle Joint	CO1
	2.	Carpentry -2 (C2)-Dovetail Joint	CO1
	3.	Fitting-1 (F1)-T-**J**oint	CO2
	4.	Fitting-2 (F2)-V-**J**oint	CO2
	5.	Plumbing-1 (P1)-Pipe Threading practice	CO3
	6.	Plumbing-2 (P2)-Pipe Layout	CO3
	7.	House Wiring-1 (E1) – Series and Parallel connection	CO4
	8.	House Wiring-2 (E2) – Fluorescent Lamp and Calling bell Circuit	CO4
Cycle-2	9.	Black Smithy (D1)	CO3
	10.	Tin Smithy (D2)	CO3

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

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

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

1. To apply the principles of thermal sciences to design and develop various thermal systems.
2. 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.
3. 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.

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
P.Vijay Kumar/B.Udaya Lakshmi/K.Srinivas	**S. Srinivas Reddy**	**J. Subba Reddy**	**Dr.S.Pichi Reddy**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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Approved by AICTE and Permanently Affiliated to JNTUK, Kakinada

LESSON PLAN

Faculty Name **: T.RADHA RANI** **D**ate: **13-12-2021**
Branch : **MECH-A** Semester: **I**
Subject : **Q.A** A.Y.: **2021-2022**

S.No.	No. of Lecture Hours	Date	Planned Topics	Actual Date	Remarks
1	1	17-12-21	Introduction to Calendars		
2	1	24-12-21	Problems on Calendars		
3	1	31-12-21	Introduction to Clocks		
4	1	07-01-22	Problems on Clocks		
5	1	21-01-22	Introduction to Blood Relations		
6	1	28-01-22	Problems on Blood Relations		
7	1	04-02-22	Introduction to Cubes and Dice		
8	1	18-02-22	Problems on Cubes and Dice		
9	1	25-02-22	Introduction to Number Series		
10	1	04-03-22	Problems on Number Series		
11	1	11-03-22	Introduction to Letter Series		
12	1	25-03-22	Problems on Letter Series		
13	1	01-04-22	Introduction to Coding and Decoding		

(T.Radha Rani)
Signature of Faculty

(Dr.Sujit Kumar Rath)
Signature of HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. K. SRIDEVI
Course Name & Code : PC-I, 20FE01
L-T-P Structure : **2-0-0** **Credits:** 02
Program/Sem/Sec : MECH-B –I SEM
A.Y. : 2021-22

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 &Writingskills.

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

CO1	Write sentences and paragraphs using proper grammatical structures and word forms.	L1
CO2	Comprehendthegiventextbyemployingsuitablestrategiesforskimmingand Scanning and draw in ferences	L2
CO3	Write summaries of reading texts using correct tense forms& Appropriate structures.	L1
CO4	Write Formal Letters; Memos & E-Mails	L3
CO5	Editthesentences/shorttextsbyidentifyingbasicerrorsofgrammar/ vocabulary/syntax	L2

Unit-I

Exploration - 'A Proposal to Girdle the Earth – Nellie Bly'; Reading: Skimming for main idea;Scanning for specific information; Grammar & Vocabulary: Content Words; Function Words;Word Forms: verbs, nouns, adjectives and adverbs; Nouns: Countable and Uncountable, Singularand Plural forms; Wh - Questions; Word Order in Sentences; Writing: Paragraph Analysis; Paragraph Writing; Punctuation and CapitalLetters

Unit–II

On Campus- 'The District School as it Was by One Who Went to it – Warren Burton'; Reading: Identifying Sequence of Ideas;

Grammar&Vocabulary: Cohesive Devices:Linkers/signposts/Transition signals, Synonyms, MeaningsofWords/Phrasesin thecontext; Writing: Memo Drafting.

Unit–III

WorkingTogether-'The Future of Work'

Reading: Making basic inferences; Strategies to use text clues for comprehension; Summarizing;Grammar & Vocabulary:Verbs: Tenses; Reporting Verbs for Academic Purpose; Writing**:** Rephrasing what is read; Avoiding redundancies and repetitions Abstract Writing/Summarizing.

Unit–IV

'A.P.J.AbdulKalam'; Grammar & Vocabulary: Direct & Indirect Speech; articles and their Omission; Writing :E-MailDrafting.

Unit–V

'C.V.Raman'; Grammar&Vocabulary: Subject-verb Agreement; Prepositions; Writing: Formal Letter Writing.

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

R1 Swan, M., "Practical English Usage", Oxford University Press, 2016.

R2 Kumar, Sand Latha, P, "Communication Skills", Oxford University Press, 2018.

R3 Rizvi Ashraf M.,"Effective Technical Communication", Tata Mc Graw Hill, NewDelhi, 2008.

R4 Baradwaj Kumkum, "Professional Communication",I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.

R5 Wood, F. T., "Remedial English Grammar" , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	15-12-2021		TLM2	
2.	Proposal to Girdle The Earth by Nellie Bly	02	16-12-2021 17-12-2021		TLM2	
3.	Reading: Skimming for main idea ; Scanning for specific information	01	22-12-2021		TLM2	
4.	Content words and Function words	01	23-12-2021		TLM2	
5.	Word forms – verbs; Adjectives & adverbs	01	24-12-2021		TLM2	
6.	Nouns – countable & uncountable, singular and plural nouns Word order in sentences, "Wh" questions	02	29-12-2021 30-12-2021		TLM2	
7.	Writing: Paragraph writing, Paragraph analysis	02	31-12-2021 05-01-2022		TLM2 TLM6	
No. of classes required to complete UNIT-I: 09				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	The District School As It Way by One Who Went to it - Warren Burton	02	06-01-2022 07-01-2022		TLM2	
9.	Identifying sequence of ideas	01	12-01-2022 19-01-2022		TLM2	
10.	Cohesive devices: linkers /signposts/transition signals	01	20-01-2022		TLM2	

11.	Synonyms meanings of words / Phrases in the context	01	21-01-2022		TLM2	
12.	Essay Writing - Memo drafting	02	27-01-2022 28-01-2022		TLM2 TLM6	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	The Future of Work	02	02-02-2022 03-02-2022		TLM2 TLM6	
14.	Making basic inferences, Strategies to uses text clues for comprehension	01	05-02-2022		TLM2	
15.	Verbs :tenses, reporting verbs for academic purpose	02	16-02-2022 17-02-2022		TLM2	
16.	Summarizing rephrasing what is read	01	18-02-2022		TLM2	
17.	avoiding redundancies and repetitions - Abstract Writing	03	23-02-2022 24-02-2022 25-02-2022		TLM2 TLM6	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	APJ Abdul Kalam	01	02-03-2022		TLM2 TLM2	
19.	APJ Abdul Kalam	01	03-03-2022		TLM2	
20.	Direct-Indirect speech	02	04-03-2022 09-03-2022		TLM2	
21.	Articles and their omission	02	10-03-2022 11-03-2022		TLM2	
22.	E-mail drafting	02	16-03-2022 17-03-2022		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 08				**No. of classes taken:**		

UNIT-V:

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

23.	C.V.Raman	02	23-03-2022 24-03-2022		TLM2	
24.	Subject – Verb agreement	01	25-03-2022		TLM2	
25.	Prepositions	01	30-03-2022		TLM2	
26.	Formal Letter Writing	02	31-03-2022 01-04-2022		TLM2 TLM6	
No. of classes required to complete UNIT-V: 06				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., I-Sem., ME - B
ACADEMIC YEAR : 2021-22
COURSE NAME & CODE : Differential Equations
L-T-P STRUCTURE : 3-2-0
COURSE CREDITS 4
COURSE INSTRUCTOR : Y. P. C. S. Anil Kumar
COURSE COORDINATOR : Dr. A. Rami Reddy
PRE-REQUISITES : None

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is to introduce the first order and higher order differential equations, functions of several variables. The students will also learn solving of first order partial differential equations.

COURSE OUTCOMES (COs)

After completion of the course, the student will be able to

CO1: Apply first order and first degree differential equations to find orthogonal trajectories.

CO2: Distinguish between the structure and methodology of solving higher order differential equations with constant coefficients.

CO3: Apply various Numerical methods to solve initial value problem.

CO4: Generate the infinite series for continuous functions and investigate the functional dependence.

CO5: Solve partial differential equations using Lagrange's method.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

R4 S. S. Sastry, *" Introductory Methods of Numerical Analysis"* 5th Edition, PHI Learning Private Limited, New Delhi, 2012.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	14/12/2021	18/01/2021	TLM1			

UNIT-I: Differential Equations of First Order and First Degree

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
2.	Introduction to UNIT I	1	15/12/2021		TLM2	CO1	T1,T2	
3.	Formation of Differential Equations	1	16/12/2021		TLM1	CO1	T1,T2	
4.	Exact DE	1	17/12/2021		TLM1	CO1	T1,T2	
5.	Non-exact DE Type I	1	18/12/2021		TLM1	CO1	T1,T2	
6.	Non-exact DE Type II	1	21/12/2021		TLM1	CO1	T1,T2	
7.	Non-exact DE Type III	1	22/12/2021		TLM1	CO1	T1,T2	
8.	**TUTORIAL 1**	1	23/12/2021		TLM3	CO1	T1,T2	
9.	Non-exact DE Type IV	1	24/12/2021		TLM1	CO1	T1,T2	
10.	Orthogonal Trajectories (Cartesian)	1	28/12/2021		TLM1	CO1	T1,T2	
11.	Orthogonal Trajectories (polar)	1	29/12/2021		TLM1	CO1	T1,T2	
12.	Orthogonal Trajectories (polar)	1	30/12/2021		TLM1	CO1	T1,T2	
13.	Problems	1	31/12/2021		TLM1	CO1	T1,T2	
14.	**TUTORIAL 2**	1	01/01/2022		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Higher Order Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Introduction to UNIT II	1	04/01/2022		TLM2	CO2	T1,T2	
16.	Solving a homogeneous DE	1	05/01/2022		TLM1	CO2	T1,T2	
17.	Finding Particular Integral, P.I for e^{ax+b}	1	06/01/2022		TLM1	CO2	T1,T2	
18.	P.I for Cos bx, or sin bx	1	07/01/2022		TLM1	CO2	T1,T2	
19.	P.I for polynomial function	1	08/01/2022		TLM1	CO2	T1,T2	
20.	P.I for $e^{ax+b}v(x)$	1	11/01/2022		TLM1	CO2	T1,T2	
21.	P.I for $e^{ax+b}v(x)$	1	12/01/2022		TLM1	CO2	T1,T2	
22.	P.I for $x^k v(x)$	1	18/01/2022		TLM1	CO2	T1,T2	
23.	Method of Variation of parameters	1	19/01/2022		TLM1	CO2	T1,T2	

24.	Method of Variation of parameters	1	20/01/2022		TLM1	CO2	T1,T2	
25.	**TUTORIAL 3**	1	21/01/2022		TLM3	CO2	T1,T2	
26.	Method of Variation of parameters	1	22/01/2022		TLM1	CO2	T1,T2	
27.	**TUTORIAL 4**	1	25/01/2022		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		13			No. of classes taken:			

UNIT-III: Numerical solution of Ordinary Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28	Introduction to Unit-III	1	27/01/2022		TLM2	CO3	T1,T2	
29	Solution by Taylor's series	1	28/01/2022		TLM1	CO3	T1,T2	
30	Solution by Taylor's series	1	29/01/2022		TLM1	CO3	T1,T2	
31	Solution by Taylor's series	1	01/02/2022		TLM1	CO3	T1,T2	
32	Picard's Method	1	02/02/2022		TLM1	CO3	T1,T2	
33	Picard's Method	1	03/02/2022		TLM1	CO3	T1,T2	
34	**TUTORIAL 5**	1	05/02/2022		TLM1	CO3	T1,T2	
I MID EXAMINATIONS (07-02-2022 TO 12-02-2022)								
35	Euler's Method	1	15/02/2022		TLM1	CO3	T1,T2	
36	Modified Euler's Method	1	16/02/2022		TLM1	CO3	T1,T2	
37	Modified Euler's Method	1	17/02/2022		TLM1	CO3	T1,T2	
38	Runge Kutta Method	1	18/02/2022		TLM1	CO3	T1,T2	
39	Runge Kutta Method	1	19/02/2022		TLM1	CO3	T1,T2	
40	**TUTORIAL 6**	1	22/02/2022		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV: Functions of Several Variables

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
41.	Introduction to UNIT IV	1	23/02/2022		TLM1	CO4	T1,T2	
42.	Generalized Mean Value Theorem, Taylor's series	1	24/02/2022		TLM1	CO4	T1,T2	
43.	Maclaurin's series	2	25/02/2022 26/02/2022		TLM1	CO4	T1,T2	
44.	Functions of several variables	2	02/03/2022 03/03/2022		TLM1	CO4	T1,T2	
45.	Jacobians (polar, cylindrical, spherical coordinates)	2	04/03/2022 05/03/2022		TLM1	CO4	T1,T2	
46.	Functional dependence	1	08/03/2022		TLM1	CO4	T1,T2	
47.	**TUTORIAL 7**	1	09/03/2022		TLM3	CO4	T1,T2	
48.	Maxima and Minima of functions of two variables	1	09/03/2022		TLM1	CO4	T1,T2	
49.	Maxima and Minima of functions of two variables	2	10/03/2022 11/03/2022		TLM1	CO4	T1,T2	
50.	**TUTORIAL 8**	1	12/03/2022		TLM3	CO4	T1,T2	

No. of classes required to complete UNIT-IV	14	No. of classes taken:

UNIT-V: Partial Differential Equations

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
51.	Introduction to UNIT V	1	15/03/2022		TLM1	CO5	T1,T2	
52.	Formation of PDE by elimination of arbitrary constants	2	16/03/2022 17/03/2022		TLM1	CO5	T1,T2	
53.	Formation of PDE by elimination of arbitrary functions	2	19/03/2022 22/03/2022		TLM1	CO5	T1,T2	
54.	**TUTORIAL 9**	1	23/03/2022		TLM3	CO5	T1,T2	
55.	Solving of PDE	1	24/03/2022		TLM1	CO5	T1,T2	
56.	Lagrange's Method	1	25/03/2022		TLM1	CO5	T1,T2	
57.	Lagrange's Method	1	26/03/2022		TLM1	CO5	T1,T2	
58.	**TUTORIAL 10**	1	29/03/2022		TLM3	CO5	T1,T2	
59.	Revision	1	31/03/2022		TLM1	CO5	T1,T2	
60.	Revision	1	01/04/2022		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
61.	Solving of PDE other methods	1	30/03/2022		TLM5	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (04-04-2022 TO 09-04-2022)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM2	PPT	**TLM6**	Assignment or Quiz
TLM3	Tutorial	**TLM7**	Group Discussion/Project
TLM4	Demonstration (Lab/Field Visit)		

Part - C

EVALUATION PROCESS:

Evaluation Task	Units	Marks
Assignment– 1	1	A1=5
Assignment– 2	2	A2=5
I-Mid Examination	1,2,3.5	B1=18
Objective Questions-1	1,2,3.5	C1=7
Assignment– 3	3	A3=5
Assignment– 4	4	A4=5
Assignment– 5	5	A5=5
II-Mid Examination	3,4,5	B2=18

Online Quiz-2	3,4,5	C2=7
Evaluation of Assignment: A=Avg (Best of Four(A1,A2,A3,A4,A5))	1,2,3,4,5	A=5
Evaluation of Mid Marks: B=75% of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=18
Evaluation of Objective Questions Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=7
Cumulative Internal Examination : A+B+C	**1,2,3,4,5**	**30**
Semester End Examinations : D	**1,2,3,4,5**	**70**
Total Marks: A+B+C+D	**1,2,3,4,5**	**100**

Y.P.C.S.Anil Kumar	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Lakshmi V R Babu Syamala
Course Name & Code : Applied Chemistry & 20FE05
L-T-P Structure : 3-0-0 **Credits:** 03
Program/Sem/Sec : B.Tech/I-sem/ME-B **A.Y. :** 2021-22

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 applica (Understand-L2)
CO2	Identify issues issues related to conventional fuels, biofuels and photo-voltaic cells in e 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 / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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
1 = Slight (Low) **2 = Moderate (Medium)** **3 = Substantial (High)**												

BOS APPROVED TEXT BOOKS:

TEXT BOOKS

1. Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.

2. Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16th Edition, 2015.

REFERENCES

1. Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015.

2. S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010.

3. Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1st 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.	Introduction to Applied Chemistry, Sources of water & quality	1	13-12-2021		TLM1	
2.	Hardness & types of hardness, Units of hardness & interrelation	1	14-12-2021		TLM1	
3.	Problems on hardness-1	1	15-12-2021		TLM1	
4.	Problems on hardness-2	1	18-12-2021		TLM1	
5.	Scale and sludges, Caustic embrittlement	1	20-12-2021		TLM1	
6.	priming and foaming, Bolier corrosion	1	21-12-2021		TLM1	
7.	W.H.O standards of potable water, Ion exchange process	1	22-12-2021		TLM1	
8.	Reverse osmosis and electro-dialysis	1	27-12-2021		TLM2	
9.	Treatment of industrial waste water	1	28-12-2021		TLM1	
10.	Revision	1	29-12-2021		TLM1	
11.	Assignment & Quiz					
No. of classes required to complete UNIT-I: 11				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	3-1-2022		TLM1	
2.	GCV, LCV and coal origin	1	4-1-2022		TLM1	
3.	Proximate Analysis & significance	1	5-1-2022		TLM1	
4.	Petroleum-origin, types of crude oil and refining of petroleum	1	8-1-2022		TLM2	
5.	Cracking - moving bed	1	10-1-2022		TLM2	

	catalytic cracking, synthetic petrol –Fischer Tropsch's process					
6.	Natural gas composition and C.N.G - advantages	1	11-1-2022		TLM1	
7.	Characteristics of bio fuels, sources of bio mass & advantages - Production of biodiesel from rape seed oil	1	12-1-2022		TLM1	
8.	Photovoltaic cell design working, advantages and disadvantages	1	18-1-2022		TLM2	
9.	Revision	1	19-1-2022		TLM1	
10.	Assignment and Quiz	1	22-1-2022			
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 Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to electrochemistry	1	24-1-2022		TLM1	
2.	Types of electrodes, Calomel Electrode	1	25-1-2022		TLM2	
3.	Glass Electrode	1	29-1-2022		TLM2	
4.	Calculation of EMF of Cell	1	31-1-2022		TLM1	
5.	Applications of Electro chemical Series, Applications of Nernst Equation-1	1	1-2-2022		TLM1	
6.	Applications of Nernst Equation-2	1	2-2-2022		TLM1	
7.	Lead-acid Battery	1	5-2-2022		TLM2	
8.	Lithium ion Battery	1	14-2-2022		TLM2	
9.	H_2– O_2 Fuel Cell, Mg-Cu reserve battery	1	16-2-2022		TLM2	
10.	Revision, Assignment & Quiz	1	19-2-2022		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.	Types of dry corrosion-oxidative corrosion, Pilling Bed worth rule	1	21-2-2022		TLM1	
2.	corrosion by other gases and liquid metal corrosion	1	22-2-2022		TLM1	
3.	Wet corrosion, mechanism	1	23-2-2022		TLM1	
4.	Concentration Cell Corrosion	1	26-2-2022		TLM2	
5.	Passivity and Galvanic series	1	28-2-2022		TLM1	
6.	Nature of metal that influences rate of corrosion	1	2-3-2022		TLM1	
7.	Nature of environment	1	5-3-2022		TLM1	

8.	Cathodic Protection	1	7-3-2022		TLM2	
9.	electro plating and metal cladding	1	8-3-2022		TLM2	
10.	Revision, Assignment & Quiz	1	9-3-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				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	12-3-2022		TLM1	
2.	Preparation properties and engineering applications of PVC, Teflon, BUNA-S and Polyurethane.	1	14-3-2022		TLM2	
3.	Preparation properties and engineering applications of BUNA-S and Polyurethane	1	15-3-2022		TLM2	
4.	Characteristics of a good lubricant and properties of lubricants; Application of properties of lubricants	1	16-3-2022		TLM1	
5.	Nano Materials Introduction, definition, extraordinary changes observed at nano size of materials and reasons	1	19-3-2022		TLM2	
6.	Types of nano-materials, Gas-Phase synthesis & Applications	1	21-3-2022		TLM2	
7.	Composites, advantageous characteristics of composites, Constituents	1	22-3-2022		TLM1	
8.	Fibre reinforced composites (GFRP, CFRP), Reasons for failure of composites	1	23-3-2022		TLM1	
9.	Revision, Assignment , Quiz	1	26-3-2022		TLM1	
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. J. Subba Reddy, Associate Professor
Mr. A. Dhanujaya Kumar, Assistant Professor (A)
Mr. K. Venkateswara Reddy, Assistant Professor (A)
Mr. S. Uma Maheshwara Reddy, Assistant Professor (A)
Mr. K. Srinivasa Rao, Assistant Professor (A)

Course Name & Code : Engineering Graphics – 20ME01
L-T-P Structure : 2-0-4 **Credits:** 4
Program/Sem/Sec : B.Tech/I Sem/B-Section **A.Y.:** 2021-22
PREREQUISITE : Engineering Physics, Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Identify the geometrical objects considering BIS standards. **(Remember-L1)**
CO2	Comprehend the basics of orthographic projections and deduce orthographic projections of a point and a line at different orientations. **(Understand-L2)**
CO3	Represent graphically the geometrical planes at different positions and orientations. **(Understand-L2)**
CO4	Analyze and draw solid objects at different positions and orientations. **(Apply- L3)**
CO5	Visualize isometric and orthographic views of geometrical objects and convert one form to another. **(Understand-L2)**

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

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

TEXTBOOKS:

T1 N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar publishers, 2012

REFERENCE BOOKS:

R1 Narayana K L, Kannaiah P, Textbook on Engineering Drawing, 2nd Edition, SciTech publishers.
R2 R.K.Dhawan, Engineering Drawing, S.Chand Company LTD.
R3 Venugopal, Engineering Drawing and Graphics, New Age publishers
R4 Dhananjay A. Jolhe, Engineering Drawing, Tata McGraw Hill Publishers
R5 N.S.Parthasarathy, Vela Murali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES AND DIMENSIONING, CONICS, CYCLOIDS, INVOLUTES

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.	Induction Programme, Orientation Classes	7	22-11-2021 To 11-12-2021	-	TLM2, 4, 5	
2.	Induction Programme, Orientation Classes	7				
3.	Induction Programme, Orientation Classes	7				
4.	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, COs, CEOs, POs and PEOs	3	14-12-2021		TLM3	
5.	Principles of Engineering Graphics and their significance, Drawing Instruments and their use-Conventions in Drawing, Practice	1	15-12-2021		TLM1	
6.	Lettering and Dimensioning – BIS conventions, Geometrical Constructions, Practice	2	16-12-2021		TLM3	
7.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General methods	1	17-12-2021		TLM1	
8.	Practice	3	21-12-2021		TLM3	
9.	Ellipse other methods, Practice	1	22-12-2021		TLM1	
10.	Parabola other methods, Practice	2	23-12-2021		TLM3	
11.	Hyperbola and rectangular hyperbola other methods, Practice	1	24-12-2021		TLM1	
12.	Practice	3	28-12-2021		TLM3	
13.	Introduction to Engineering Curves, Numericals on conics	1	29-12-2021		TLM1	
14.	Cycloid, Epicycloid and Practice	2	30-12-2021		TLM3	
15.	Hypocycloid; Involutes	1	31-12-2021		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

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 II: ORTHOGRAPHIC PROJECTIONS** Introduction to Orthographic Projections, First and third angle projection methods, Practice	3	04-01-2022		TLM1, 3	
17.	Projections of Points	1	05-01-2022		TLM1	
18.	Practice	2	06-01-2022		TLM3	
19.	Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	1	07-01-2022		TLM1	
20.	Practice	3	11-01-2022		TLM3	
21.	Projections of lines when inclined to both the planes	1	12-01-2022		TLM1	
22.	True lengths and traces, Practice	2	13-01-2022		TLM3	
23.	Practice	3	18-01-2022		TLM1	
24.	Numericals	1	19-01-2022		TLM1	
25.	Practice	2	20-01-2022		TLM3	
26.	Numericals	1	21-01-2022		TLM1	
No. of classes required to complete UNIT-II: 11				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	**UNIT III: PROJECTIONS OF PLANES:** Introduction to Projection of Planes	3	25-01-2022		TLM1, 3	
28.	Planes parallel to one of the reference planes, Practice	2	27-01-2022		TLM1, 3	
29.	Inclined to one reference plane and perpendicular to other, Practice	1	28-01-2022		TLM1	
30.	Practice, Lines	3	01-02-2022		TLM3	
31.	Practice, Lines	1	02-02-2022		TLM1	
32.	Practice, Lines	2	03-02-2022		TLM3	
33.	Oblique planes, Numericals, Practice	1	04-02-2022		TLM1	
	I Mid Examinations		**07-02-2022 to 12-02-2022**		**-**	
34.	Practice, Planes	3	15-02-2022		TLM3	
35.	Practice, Planes	1	16-02-2022		TLM1	
36.	Practice, Planes	2	17-02-2022		TLM3	
37.	Numericals	1	18-02-2022		TLM1	
No. of classes required to complete UNIT-III: 11			**No. of classes taken:**			

UNIT-IV: PROJECTIONS OF SOLIDS

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.	**UNIT IV: PROJECTIONS OF SOLIDS –** Introduction to Projections of Solids, Practice	3	22-02-2022		TLM1, 3	
39.	Projection of solids in simple positions, resting on HP	1	23-02-2022		TLM1	
40.	Practice	2	24-02-2022		TLM3	
41.	Projection of solids in simple positions, resting on VP	1	25-02-2022		TLM1	
42.	Practice	3	01-03-2022		TLM3	
43.	Axis inclined to one of the reference planes and parallel to the other, Practice	1	02-03-2022		TLM1	
44.	Practice	2	03-03-2022		TLM3	
45.	Axis inclined to both H.P and V.P.	1	04-03-2022		TLM1	
46.	Practice	3	08-03-2022		TLM3	
47.	Numericals	1	09-03-2022		TLM1	
48.	Practice	2	10-03-2022		TLM3	
49.	Numericals	1	11-03-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken: (including Practice)**		

UNIT-V: ISOMETRIC VIEWS: TRANSFORMATION OF PROJECTIONS FROM ORTHOGRAPHIC PROJECTIONS TO ISOMETRIC VIEW and VICE VERSA

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.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice	3	15-03-2022		TLM1, 3	
51.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice	1	16-03-2022		TLM1	
52.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing, Practice	2	17-03-2022		TLM3	
53.	**TRANSFORMATION OF PROJECTIONS:** Introduction	1	18-03-2022		TLM1	
54.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	3	22-03-2022		TLM1, 3	
55.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	1	23-03-2022		TLM1	
56.	Practice, Solids	2	24-03-2022		TLM3	
57.	Practice, Solids	1	25-03-2022		TLM1	
58.	Practice, Solids	3	29-03-2022		TLM3	
59.	Numericals	1	30-03-2022		TLM1	
60.	Practice, Isometric Views	2	31-03-2022		TLM3	
61.	Numericals	1	01-04-2022		TLM1	
No. of classes required to complete UNIT-V:				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	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.
PSO 3	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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. S. Pichi Reddy
Signature				

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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 : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 20EE02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/I/MECH-B **A.Y.:** 2021-22

PREREQUISITE: Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables student to illustrate the basics of applied electricity and electronics.

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

CO1	Apply network reduction techniques to simplify electrical circuits. **(Apply – L3)**
CO2	Illustrate the working principle of DC machines and transformers. **(Understand – L2)**
CO3	Understand V-I characteristics of semiconductor devices. **(Understand – L2)**
CO4	Illustrate the configuration of transistors and their applications. **(Understand – L2)**

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

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

TEXTBOOKS:

T1 A.Sudhakar and Shyammohan S Palli, "Electrical Circuits" Tata McGraw-Hill, 3rd Edition.2017

T2 M.S.Sukhija, T.K.Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford University Press, 2016 Edition.

REFERENCE BOOKS:

R1 Kothari and Nagarath, "Basic Electrical Engineering", TMH Publications, 3rd Edition.2013

R2 G.S.N.Raju, "Electronic Devices and Circuits", I.K.International.2006

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ELECTRICAL CIRCUIT FUNDAMENTALS

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.	Basic definitions	1	13-12-2021		TLM1	
2.	Types of elements	1	14-12-2021		TLM1	
3.	Ohm's Law	1	15-12-2021		TLM1	
4.	Kirchhoff's Laws	1	16-12-2021		TLM1	
5.	series, parallel Reduction	1	20-12-2021		TLM1	
6.	Star-Delta Reduction	1	21-12-2021		TLM1	
7.	Source Transformation Technique	1	22-12-2021		TLM1	
8.	Mesh analysis	1	23-12-2021		TLM1	
9.	Nodal Analysis	1	27-12-2021		TLM1	
10.	Problems	1	28-12-2021		TLM1	
11.	Problems	1	29-12-2021		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: DC NETWORK THEOREMS & AC FUNDAMENTALS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Superposition Theorem	1	30-12-2021		TLM1	
13.	Thevenin's Theorem	1	03-01-2022		TLM1	
14.	Norton's Theorem	1	04-01-2022		TLM1	
15.	Maximum Power Transfer Theorem	1	05-01-2022		TLM1	
16.	Peak, R.M.S, average and instantaneous values, Form factor and Peak factor for periodic waveforms	1	06-01-2022		TLM1	
17.	Phase and Phase difference	1	10-01-2022		TLM1	
18.	Reactance, Impedance, Susceptance and Admittance, Real, Reactive and apparent Powers, Power Factor	1	11-01-2022		TLM1	
19.	Resonance	1	17-01-2022		TLM1	
20.	Problems	1	18-01-2022		TLM1	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT-III: DC MACHINE FUNDAMENTALS AND SINGLE-PHASE TRANSFORMERS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	DC generator principle	1	19-01-2022		TLM1	
22.	construction details	1	20-01-2022		TLM1	
23.	emf equation	1	24-01-2022		TLM1	
24.	types of generators	1	25-01-2022		TLM1	
25.	DC motor principle	1	27-01-2021		TLM1	
26.	Back emf	1	31-01-2022		TLM1	
27.	types of motors	1	01-02-2022		TLM1	
28.	Principle of operation of 1-Phase transformers	1	02-02-2022		TLM1	
29.	Construction	1	03-02-2022		TLM1	
30.	emf equation	1	14-02-2022		TLM1	
31.	Problems	1	15-02-2022		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: P-N JUNCTION DIODE AND ZENER DIODE

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Introduction	1	16-02-2022		TLM1	
33.	P-N junction diode	1	17-02-2022		TLM1	
34.	Operation	1	18-02-2022		TLM1	
35.	V-I characteristics of PN junction	1	21-02-2022		TLM1	
36.	Rectifiers	1	22-02-2022		TLM1	
37.	Half wave rectifier	1	23-02-2022		TLM1	
38.	Full wave rectifier	1	24-02-2022		TLM1	
39.	Bridge type	1	28-02-2022		TLM1	
40.	Zener diode	1	02-03-2022		TLM1	
41.	Voltage regulator	1	03-03-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TRANSISTORS

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.	Introduction	1	07-03-2022		TLM1	
43.	Construction	1	08-03-2022		TLM1	
44.	Principle of operation, Symbol	1	09-03-2022		TLM1	
45.	CB configuration	1	10-03-2022		TLM1	
46.	CE configuration	1	14-03-2022		TLM1	
47.	JFET - Operation	1	15-03-2022		TLM1	
48.	JFET - Characteristics	1	16-03-2022		TLM1	
49.	MOSFET - Operation	1	17-03-2022		TLM1	
50.	MOSFET - Characteristics	1	21-03-2022		TLM1	
51.	application of transistor as an amplifier	1	22-03-2022		TLM1	
52.	Revision	1	23-03-2022		TLM1	
53.	Revision	1	24-03-2022		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-12-2021	05-02-2022	8W
I Mid Examinations	07-02-2022	12-02-2022	1W
II Phase of Instructions	14-02-2022	02-04-2022	7W
II Mid Examinations	04-04-2022	09-04-2022	1W
Preparation and Practicals	11-04-2022	16-04-2022	1W
Semester End Examinations	18-04-2022	30-04-2022	2W

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	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	**Mrs.R.Padma**	**Mr R ANJANEYULU NAIK**	**Dr G.NAGESWARA RAO**	**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 FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor **:** Dr. Lakshmi V R Babu Syamala
Course Name & Code **:** Applied Chemistry Lab & 20FE52
L-T-P Structure **:** 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/II-sem/ME-B **A.Y. :** 2021-22

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
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus
CO3: Acquire practical knowledge related to preparation of polymers
CO4: Exhibit skills in performing experiments based on theoretical fundamentals.

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-B

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; Determination of pH of the given sample solution/soil using pH meter	3	18-12-2021		TLM2	CO4	
2.	Introduction and Glassware explanation; Preparation of Bakelite	3	8-1-2022		TLM2	CO4	
3.	Determination of amount of Na_2CO_3 using standard HCl solution	3	22-1-2022		TLM4	CO2,CO4	
4.	Estimation of Mohr's salt using standard $KMnO_4$	3	29-01-2022		TLM4	CO3,CO4	
5.	Estimation of Mohr's salt using standard $K_2Cr_2O_7$	3	05-02-2022		TLM4	CO4	
6.	Determination of total Hardness of water using EDTA method	3	19-02-2022		TLM4	CO3,CO4	
7.	Determination of permanent hardness of using EDTA method	3	26-02-202		TLM4	CO1,CO4	
8.	Determination of alkalinity of water sample	3	05-03-2022		TLM4	CO1,CO4	
9.	Preparation of nylon fibres	3	12-03-2022		TLM4	CO1,CO4	
10.	Nephelometry	3	19-03-2022		TLM4	CO2,CO4	
11.	Internal Lab Exam	3	26-03-2022		TLM4	CO2,CO4	
Total							

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

Part - C

EVALUATION PROCESS:

According to academic regulations of R20, distribution and weightage of marks for laboratory courses 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
Total		**15 Marks**

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.

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.R.Padma, Mr.V.Prabhakar Reddy
Course Name & Code : **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB**
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., MECH., I-Sem., Sections- B A.Y : 2021-22

PRE-REQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):. This lab course enables the student to demonstrate the knowledge of electrical and electronic equipment and analysis of electric circuits. It also deals with plotting characteristics of basic semiconductor devices.

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

CO 1	Examine electrical circuits using network theorems
CO 2	Analyze VI characteristics of semiconductor devices.
CO 3	Analyze electrical circuits.
CO4	Design Resonance circuits.

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

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
3	2		2	2			3	3	3		1			
3	2		2	2			3	3	3		1			
3	2		2	2			3	3	3		1			
3	2		3	2			3	3	3		1			

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

List of Experiments

(Any of the 10 experiments are required to be conducted)

1. V-I relations of passive elements (R, L, C).
2. Verification of Kirchhoff's Laws (KCL and KVL.).
3 Measurement of active power, reactive power and power factor of AC circuits.
4. Calculation of Resonant frequency, Bandwidth and Quality factor of resonant circuits.
5. Verification of Superposition theorem.
6. Verification of Thevenin's and Norton's theorems.
7. Verification of Maximum power transfer theorem.
8. Plot the V-I characteristics of a p-n junction diode.
9. Plot the V-I characteristics of Zener diode.
10. Plot the V-I characteristics of BJT.
11. Calculation of ripple factor and regulation of Full Wave Rectifier with and without filters .
12. Plot the V-I characteristics of MOSFET.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

DAY: Monday (4,5,6 Hours) Regd.Nos:

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
Tentative Date		20/12/21	27/12	03/1/22	10/1/22	24/1/22	31/1/22	14/2/22	21/2/22	28/2/22	7/3/22	14/3/22	21/3/22	28/3/22
Actual Date														
B-1		Demo	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	TEST
B-2		Demo	2	3	4	5	1	7	8	9	10	6		
B-3		Demo	3	4	5	1	2	8	9	10	6	7		
B-4		Demo	4	5	1	2	3	9	10	6	7	8		
B-5		Demo	5	1	2	3	4	10	6	7	8	9		
B-6		Demo	1	2	3	4	5	6	7	8	9	10		
B-7		Demo	2	3	4	5	1	7	8	9	10	6		
B-8		Demo	3	4	5	1	2	8	9	10	6	7		
B-9		Demo	4	5	1	2	3	9	10	6	7	8		
B-10		Demo	5	1	2	3	4	10	6	7	8	9		

DAY: Friday (1,2 ,3 Hours)
Roll.Nos:

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative Date	17/12/21	31/12/22	7/1/22	21/1/22	28/1/22	4/2/22	18/2/22	25/2/22	4/3/22	11/3/22	18/3/22	25/3/22	1/4/22
	Actual Date													
B-1		Demo	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	TEST
B-2		Demo	1	2	3	4	5	6	7	8	9	10		
B-3		Demo	1	2	3	4	5	6	7	8	9	10		
B-4		Demo	1	2	3	4	5	6	7	8	9	10		
B-5		Demo	1	2	3	4	5	6	7	8	9	10		
B-6		Demo	1	2	3	4	5	6	7	8	9	10		
B-7		Demo	1	2	3	4	5	6	7	8	9	10		
B-8		Demo	1	2	3	4	5	6	7	8	9	10		
B-9		Demo	1	2	3	4	5	6	7	8	9	10		
B-10		Demo	1	2	3	4	5	6	7	8	9	10		

ACADEMIC CALENDAR:

Description	From	To	Weeks
Commencement of class work	6-1-21 to 10-1-21 (Induction Program)		
I phase of Instructions	13-12-2021	05-02-2022	8 W
I Mid Examinations	07-02-2022	12-02-2022	1 W
II Phase of Instructions	14-02-2022	02-04-2022	7 W
II Mid Examinations	04-04-2022	09-04-2022	1 W
Preparation and Practical	11-4-2022	16-4-2022	1 W
Semester End Examinations	18-4-2022	30-04-2022	2 W

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mrs R.Padma	Dr.G.Nageswara Rao	Dr.J.Siva Vara Prasad
Course Instructor	**Module Coordinator**	**HOD**

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. I-Sem., ME –B Section

ACADEMIC YEAR : 2021-2022

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : K. Karthik/ Seelam Srinivasa Reddy

COURSE COORDINATOR : Seelam Srinivasa Reddy

PRE-REQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

COURSE OBJECTIVE:

The objective of this course is to get familiarized with various trades used in Engineering Workshop and learn the safety pre-cautions to be followed in the workshops, while working with the different tools.

COURSE OUTCOMES (CO)

CO 1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
CO 2	Fabricate and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
CO 3	Produce various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
CO 4	Perform various basic House Wiring techniques.

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (BATCH-BI)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	13-12-2021		TLM8	R1	
2.	Experiment-1	3	20-12-2021		TLM8	R1	
3.	Experiment-2	3	27-12-2021		TLM8	R1	
4.	Experiment-3	3	3-01-2022		TLM8	R1	
5.	Experiment-4	3	17-01-2022		TLM8	R1	
6.	Experiment-5	3	24-01-2022		TLM8	R1	
7.	Experiment-6	3	31-01-2022		TLM8	61	
8.	Experiment-7	3	14-02-2022		TLM8	R1	
	07-02-2022 : MID-I Exam						
9.	Experiment-8	3	21-02-2022		TLM8	R1	
10	Demonstration of Forging	3	28-02-2022		TLM8	R1	
11.	Demonstration of Tin Smithy & Repetition	3	7-03-2022		TLM8	R1	
12.	Repetition	3	14-03-2022		TLM8	R1	
13	Repetition	3	21-03-2022		TLM8	R1	
14.	Lab Internal	3	28-03-2022		TLM6		

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (BATCH-B2)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Programme	3	31-12-2021		TLM8	-	
2.	Demonstration	3	17-12-2021		TLM8	R1	
3.	Demonstration	3	24-12-2021		TLM8	R1	
4.	Experiment-1	3	31-12-2021		TLM8	R1	
5.	Experiment-2	3	07-01-2022		TLM8	R1	
6.	Experiment-3	3	14-01-2022		TLM8	R1	
7.	Experiment-4	3	21-01-2022		TLM8	R1	
8.	Experiment-5	3	28-01-2022		TLM8	R1	
9.	Experiment-6	3	4-02-2022		TLM8	R1	
7-02-2022 MID-1 EXAM							
10.	Experiment-7	3	18-02-2022		TLM8	R1	
11.	Experiment-8	3	25-02-2022		TLM8	R1	
12.	Demonstration of Forging	3	04-03-2022		TLM8	R1	
13.	Demonstration of Tin Smithy	3	11-03-2022		TLM8	R1	
14.	Repetition	3	18-03-2022		TLM8	R1	
15.	Repetition	3	25-03-2022		TLM8	R1	
16.	Lab Internal	3	1-04-2022		TLM6		

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
Induction Programme	22-11-2021	11-12-2021	
I Phase of Instructions-1	13-12-2021	5-02-2022	8W
I Mid Examinations	07-02-2022	12-02-2022	1W
II Phase of Instructions	14-02-2022	02-04-2022	7W
II Mid Examinations	04-04-2022	09-04-2022	1W
Preparation and Practicals	11-04-2022	16-04-2022	1W
Semester End Examinations	18-04-2022	30-04-2022	2W

EVALUATION PROCESS:

Part - C

Parameter		Marks
Day – to – Day Work	Observation	A1 = 05 Marks
	Record	A2 = 10 Marks
Internal Test		B =10 Marks
Viva – Voce During Regular Lab Sessions		C = 05 Marks
Cumulative Internal Examination		A1+ A2 + B+C = 30 Marks
Semester End Examinations		D =70 Marks
Total Marks: A1+ A2 + B + C + D		100 Marks

etails of Batches: B-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B11	21761A0332-339	8	**B21**	21761A0347-354	8
B12	21761A0340-346	7	**B22**	21761A0355-362	8

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
B11	C1	C2	F1	F2	P1	P2	E1	E2	D1	D2
B12	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2
B21	C1	C2	F1	F2	P1	P2	E1	E2	D1	D2
B22	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry -1 (C1)-Corner Bridle Joint	CO1
2.	Carpentry -2 (C2)-Dovetail Joint	CO1
3.	Fitting-1 (F1)-T-**J**oint	CO2
4.	Fitting-2 (F2)-V-**J**oint	CO2
5.	Plumbing-1 (P1)-Pipe Threading practice	CO3
6.	Plumbing-2 (P2)-Pipe Layout	CO3
7.	House Wiring-1 (E1) – Series and Parallel connection	CO4
8.	House Wiring-2 (E2) – Fluorescent Lamp and Calling bell Circuit	CO4
9.	Black Smithy (D1)	CO3
10.	Tin Smithy (D2)	CO3

NOTIFICATION OF CYCLE

Cycle	Exp.No.	Name of the Experiment	Related CO
Cycle-1	1.	Carpentry -1 (C1)-Corner Bridle Joint	CO1
	2.	Carpentry -2 (C2)-Dovetail Joint	CO1
	3.	Fitting-1 (F1)-T-**J**oint	CO2
	4.	Fitting-2 (F2)-V-**J**oint	CO2
	5.	Plumbing-1 (P1)-Pipe Threading practice	CO3
	6.	Plumbing-2 (P2)-Pipe Layout	CO3
	7.	House Wiring-1 (E1) – Series and Parallel connection	CO4
	8.	House Wiring-2 (E2) – Fluorescent Lamp and Calling bell Circuit	CO4
Cycle-2	9.	Black Smithy (D1)	CO3
	10.	Tin Smithy (D2)	CO3

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyse 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 modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

1. To apply the principles of thermal sciences to design and develop various thermal systems.
2. 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.
3. 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.

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
K.Karthik/S.Srinivasa Reddy	**S. Srinivasa Reddy**	**J. Subba Reddy**	**Dr.S. Pichi Reddy**