LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. K. SRIDEVI
Course Name & Code **:** PC-I, 20FE01
L-T-P Structure **: 2-0-0** **Credits:** 02
Program/Sem/Sec : EEE-A –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	14-12-2021		TLM2	
2.	Proposal to Girdle The Earth by Nellie Bly	02	17-12-2021 18-12-2021		TLM2	
3.	Reading: Skimming for main idea ; Scanning for specific information	01	21-12-2021		TLM2	
4.	Content words and Function words	01	24-12-2021		TLM2	
5.	Word forms – verbs; Adjectives & adverbs	01	28-12-2021		TLM2	
6.	Nouns – countable & uncountable, singular and plural nouns Word order in sentences, "Wh" questions	01	31-12-2021		TLM2	
7.	Writing: Paragraph writing, Paragraph analysis	02	04-01-2022 07-01-2022		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	08-01-2022 11-01-2022		TLM2	
9.	Identifying sequence of ideas	01	18-01-2022		TLM2	
10.	Cohesive devices: linkers /signposts/transition signals	01	21-01-2022		TLM2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Synonyms meanings of words / Phrases in the context	01	22-01-2022		TLM2	
12.	Essay Writing - Memo drafting	02	25-02-2021 28-02-2021 29-01-2022		TLM2 TLM6	

No. of classes required to complete UNIT-II: 07   **No. of classes taken:**

UNIT-III:

S. N o.	Topics to be covered	No. of Class es Requi re D	Tentative Date of Completion	Actual Date of Completi on	Teachin g Learnin g Metho ds	HOD Sign Weekl y
13.	The Future of Work	02	01-02-2022 04-02-2022		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	15-02-2022 18-02-2022 19-02-2022		TLM2	
16.	Summarizing rephrasing what is read	01	22-02-2022		TLM2	
17.	avoiding redundancies and repetitions - Abstract Writing	02	25-02-2022 26-02-2022		TLM2 TLM6	

No. of classes required to complete UNIT-III: 08   **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	04-03-2022		TLM2 TLM2	
19.	APJ Abdul Kalam	01	05-03-2022 08-03-2022		TLM2	
20.	Direct-Indirect speech	01	11-03-2022		TLM2	
21.	Articles and their omission	01	12-03-2022		TLM2	
22.	E-mail drafting	02	15-03-2022 19-03-2022		TLM2 TLM6	

No. of classes required to complete UNIT-IV: 06   **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	01	22-03-2022		TLM2	
24.	C.V.Raman	01	25-03-2022		TLM2	
25.	Subject – Verb agreement	01	26-03-2022		TLM2	
26.	Prepositions	01	29-03-2022		TLM2	
27.	Formal Letter Writing	01	01-04-2022		TLM2 TLM6	
No. of classes required to complete UNIT-V: 05				**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

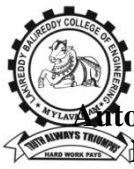**EVALUATION PROCESS (R17 Regulation):**

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

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	K. Sridevi	Dr. B. Samrajya Lakshmi	Dr. B. Samrajya Lakshmi	Dr. A. Ramireddy
Signature				

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L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM   : B. Tech. I-Sem.; EEE-B

ACADEMIC YEAR   : 2021-22

COURSE NAME & CODE : Professional Communication - I (20FE01)

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

COURSE CREDITS   : 3

COURSE INSTRUCTOR   : Mr.B Sagar

COURSE COORDINATOR: Dr. B. Samrajya Lakshmi

Pre-requisites   : Basics in English Grammar & Vocabulary

Course Educational Objective (CEOs) : Improve the proficiency of students in English with an emphasis on Vocabulary& Grammar for better communication in formal and informal situations; Develop listening skills required for thorough understanding and analysis to face interviews with confidence.

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

CO1 : Use English vocabulary & grammar effectively while speaking and writing.
CO2   : Comprehend the given texts and Communicate confidently in formal and
               informal contexts.
CO3   : Draft E-mails& Memos .
CO4   : Understand the written and spoken information thoroughly.
CO5   : Face interviews with confidence.

Course Articulation Matrix:

Course Code	COs	Programme Outcomes												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
17FE01	CO1				2					3	3		2			
	CO2		1		2		1			3	3		2			
	CO3				2					3	3		2			
	CO4		1		2		1			3	3		2			
	CO5				2					3	3		2			
1 = Slight (Low)		**2 = Moderate (Medium)**						**3-Substantial(High)**								

BOS APPROVED TEXT BOOKS:

T1	Board of Editors, "Fluency in English – A Course book for Engineering Students", Orient Black Swan, Hyderabad, 2016.
T2	Dhanavel S.P, "English and Soft Skills", Orient Black Swan, Hyderabad, 2010.

BOS APPROVED REFERENCE BOOKS:

R1	Murphy, "English Grammar with CD", Cambridge University Press, New Delhi, 2004.
R2	Rizvi Ashraf M., "Effective Technical Communication", Tata Mc Graw Hill, New Delhi, 2008.
R3	Baradwaj Kumkum, "Professional Communication", I.K.International Publishing House Pvt.Lt., New Delhi, 2008.
R4	Raman, Meenakshi; Sharma, Sangeeta,. "Technical Communication -Principles and Practice" Oxford University Press, New Delhi, Third Edition. 2015.

Part-B
COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to UNIT-I	1	13-12-2021		TLM1			
2.	Proposal to Girdle The Earth by Nellie Bly	1	17-12-2021		TLM1	CO1	T1	
3.	Skimming for main idea ; Scanning for specific information	1	18-12-2021		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
4.	Content words and Function words	1	20-12-2021		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
5.	Word forms – verbs; Adjectives & adverbs	1	24-12-2021		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
6.	Nouns – countable & uncountable,	1	27-12-2021		TLM1, TLM2, TLM5	CO1	T1,R1,R3	

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
	singular and plural nouns							
7.	Word order in sentences, "Wh" questions	1	31-12-2021		TLM1	CO1	T1	
8.	Paragraph writing, Paragraph analysis	1	03-01-2022		TLM1, TLM2	CO1	T1,R2,R4	
9.	Punctuation & Capital letters	1	07-01-2022		TLM1, TLM2, TLM5, TLM6	CO1	T2,R2,R4	
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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
10.	The District School As It Way by One Who Went to it - Warren Burton	1	08-01-2022		TLM1, TLM6	CO2	T2	
11.	Identifying sequence of ideas	1	10-01-2022		TLM1, TLM6	CO2	T2,R2,R4	
12.	Cohesive devices: linkers /signposts/transition signals	1	21-01-2022		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
13.	Cohesive devices: linkers /signposts/transition signals	1	22-01-2022		TLM1, TLM6	CO2	T2	
14.	Synonyms meanings of words / Phrases in the context	1	24-01-2022		TLM1, TLM6	CO2	T2,R2,R4	

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.	Synonyms meanings of words / Phrases in the context	1	28-01-2022		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
16.	Memo drafting	2	29-01-2022		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
17.	Memo drafting	2	31-01-2022		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
No. of classes required to complete UNIT-II : 08					No. of classes taken:			

UNIT-III :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	The Future of Work	1	04-02-2022		TLM1	CO3	T1	
19.	Making basic inferences, Strategies to uses text clues for comprehension	1	05-02-2022		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
20.	Verbs :tenses, reporting verbs for academic purpose	1	14-02-2022		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
21.	Summarizing rephrasing what is read	1	18-02-2022		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
22.	avoiding redundancies and repetitions	1	19-02-2022		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
23.	avoiding redundancies and repetitions	1	21-02-2022		TLM1, TLM6	CO3	T1	
24.	avoiding redundancies and repetitions	1	25-02-2022		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
No. of classes required to complete UNIT-III : 07					No. of classes taken:			

UNIT-IV :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25.	APJ Abdul Kalam	3	26-2-2022 28-2-2022		TLM1, TLM6	CO4	T2	
26.	Direct-Indirect speech	2	4-03-2022		TLM1, TLM6	CO4	T2,R2,R4	
27.	Articles and their omission	1	05-03-2022		TLM1, TLM2,	CO4	T2,R1,R3	
28.	E-mail drafting	1	07-03-2022		TLM1, TLM2,	CO4	T2,R1,R3	
No. of classes required to complete UNIT-IV : 06					No. of classes taken:			

UNIT-V :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29	C.V.Raman	1	11-03-2022 12-03-2022		TLM1, TLM6	CO5	T2	
30	Subject – Verb agreement	1	14-03-2022		TLM1, TLM6	CO5	T2,R2,R4	
31	Prepositions	1	18-03-2022		TLM1, TLM6	CO5	T2,R2,R4	
32	Formal Letter Writing	1	19-03-2022		TLM1, TLM2, TLM5, TLM6	CO5	T2,R2,R4	
33	Verbal Reasoning	1	21-03-2022		TLM1, TLM2, TLM5, TLM6	CO1 & CO5	Book of Reasoning by Agarwal	
34	Topics beyond syllabus(vocabulary)	1	25-03-2022 26-03-2022		TLM1, TLM2		Book of Reasoning by Agarwal	
No. of classes required to complete UNIT-V : 10					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:

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

PROGRAM OUTCOMES

Engineering Graduates will be able to:

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

Mr. B.Sagar	**Prof. B. Samrajya Lakshmi**	**Prof. B.Samrajya Lakshmi**	**Prof. A. Ramireddy**
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

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COURSE HANDOUT
Part-A

PROGRAM	**:** I B. Tech., I-Sem., EEE A
ACADEMIC YEAR	**:** 2021-22
COURSE NAME & CODE	**:** Differential Equations
L-T-P STRUCTURE	**:** 4-0-0
COURSE CREDITS	**:** 4
COURSE INSTRUCTOR	**:** Dr. K.R. Kavitha
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", 42ndEdition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1stEdition, 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	14/12/2022		TLM2			

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		TLM1	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.	Non-exact DE Type IV	1	23/12/2021		TLM1	CO1	T1,T2	
9.	Orthogonal Trajectories (Cartesian)	1	28/12/2021		TLM1	CO1	T1,T2	
10.	Orthogonal Trajectories (Cartesian)	1	29/12/2021		TLM1	CO1	T1,T2	
11.	Orthogonal Trajectories (polar)	1	30/12/2021		TLM1	CO1	T1,T2	
12.	Orthogonal Trajectories (polar)	1	31/12/2021		TLM1	CO1	T1,T2	
13.	Problems	1	04/01/2022		TLM1	CO1	T1,T2	
14.	**TUTORIAL 1**	1	05/01/2022		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	06/01/2022		TLM2	CO2	T1,T2	
16.	Solving a homogeneous DE	1	07/01/2022		TLM1	CO2	T1,T2	
17.	Finding Particular Integral, P.I for $e^{ax+b}\, e^{ax}$	1	08/01/2022		TLM1	CO2	T1,T2	
18.	P.I for Cos bx or sin bx	1	11/01/2022		TLM1	CO2	T1,T2	
19.	P.I for polynomial function	1	18/01/2022		TLM1	CO2	T1,T2	
20.	P.I for $e^{ax+b}v(x)$	1	19/01/2022		TLM1	CO2	T1,T2	
21.	P.I for $e^{ax+b}v(x)$	1	20/01/2022		TLM1	CO2	T1,T2	
22.	P.I for $x^k v(x)$	1	21/01/2022		TLM1	CO2	T1,T2	

23.	P.I for $x^k v(x)$	1	22/01/2022		TLM1	CO2	T1,T2	
24.	Method of Variation of parameters	1	25/01/2022		TLM1	CO2	T1,T2	
25.	Method of Variation of parameters	1	27/01/2022		TLM1	CO2	T1,T2	
26.	**TUTORIAL 2**	1	02/02/2022		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		12			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
27.	Introduction to Unit-III	1	28/01/2022		TLM2	CO3	T1,T2	
28.	Numerical Methods	1	29/01/2022		TLM1	CO3	T1,T2	
29.	Solution by Taylor's series	1	01/02/2022		TLM1	CO3	T1,T2	
30.	Solution by Taylor's series	1	03/02/2022		TLM1	CO3	T1,T2	
31.	Picard's Method	1	04/02/2022		TLM1	CO3	T1,T2	
32.	Picard's Method	1	05/02/2022		TLM1	CO3	T1,T2	
II MID EXAMINATIONS (07-02-2022 TO 12-02-2022)								
33.	Euler's Method	1	15/02/2022		TLM1	CO3	T1,T2	
34.	Modified Euler's Method	1	16/02/2022		TLM1	CO3	T1,T2	
35.	Modified Euler's Method	1	17/02/2022		TLM1	CO3	T1,T2	
36.	Runge- Kutta Method	1	18/02/2022		TLM1	CO3	T1,T2	
37.	Runge- Kutta Method	1	19/02/2022		TLM1	CO3	T1,T2	
38.	**TUTORIAL 3**	1	23/02/2022		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
39.	Introduction to UNIT IV	1	22/02/2022		TLM1	CO4	T1,T2	
40.	Generalized Mean Value Theorem, Taylor's series	1	24/02/2022		TLM1	CO4	T1,T2	
41.	Maclaurin's series	1	25/02/2022		TLM1	CO4	T1,T2	
42.	Functions of several variables	1	26/02/2022		TLM1	CO4	T1,T2	
43.	Jacobians(Cartesian coordinates)	1	02/03/2022		TLM1	CO4	T1,T2	
44.	Jacobians (polar, coordinates)	1	03/03/2022		TLM1	CO4	T1,T2	
45.	Jacobians (cylindrical, spherical	1	04/03/2022		TLM1	CO4	T1,T2	

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
	coordinates)							
46.	Functional dependence	1	05/03/2022		TLM1	CO4	T1,T2	
47.	Maxima and Minima	1	08/03/2022		TLM1	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	1	10/03/2022		TLM1	CO4	T1,T2	
50.	**TUTORIAL 4**	1	16/03/2022		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		12			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	11/03/2022		TLM1	CO5	T1,T2	
52.	Partial Differential equations	1	15/03/2022		TLM1	CO5	T1,T2	
53.	Formation of PDE by elimination of arbitrary constants	1	17/03/2022		TLM1	CO5	T1,T2	
54.	Formation of PDE by elimination of arbitrary functions	1	19/03/2022		TLM1	CO5	T1,T2	
55.	Formation of PDE by elimination of arbitrary functions	1	22/03/2022		TLM1	CO5	T1,T2	
56.	Formation of PDE by elimination of arbitrary functions	1	23/03/2022		TLM1	CO5	T1,T2	
57.	Solving of PDE	1	24/03/2022		TLM1	CO5	T1,T2	
58.	Solving of PDE	1	25/03/2022		TLM1	CO5	T1,T2	
59.	Lagrange's Method	1	26/03/2022		TLM1	CO5	T1,T2	
60.	Lagrange's Method	1	29/03/2022		TLM1	CO5	T1,T2	
61.	**TUTORIAL 5**	1	30/03/2022		TLM3	CO5	T1,T2	
62.	Revision	1	31/03/2022					
No. of classes required to complete UNIT-V		12			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
63.	Lagrange's Method	1	12/03/2022		TLM1	CO4	T1,T2	
64.	Solving of PDE other methods	1	01/04/2022		TLM5	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (03-04-2021 TO 09-04-2021)								

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 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.

Dr. K.R. KAVITHA	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
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. A. Rami Reddy
Course Name & Code : Differential Equations&20FE03
L-T-P Structure : 3-2 -0   **Credits:**4
Program/Sem/Sec : I B.Tech/I sem/B   **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	13/12/2021		TLM1	
2.	Introduction to UNIT I	1	15/12/2021		TLM1	
3.	Formation of Differential Equations	1	16/12/2021		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	20/12/2021		TLM1	
7.	Non-exact DE Type III	1	22/12/2021		TLM1	
8.	**TUTORIAL 1**	1	23/12/2021		TLM3	
9.	Non-exact DE Type IV	1	27/12/2021		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	03/01/2022		TLM1	
14.	**TUTORIAL 2**	1	05/01/2022		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	06/01/2022		TLM2	
16.	Solving a homogeneous DE	1	07/01/2022		TLM1	
17.	Finding Particular Integral, P.I for $e^{ax+b}\,e^{ax}$	1	08/01/2022		TLM1	
18.	P.I for Cos bx, or sin bx	1	10/01/2022		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	22/01/2022		TLM1	
24.	P.I for $x^k v(x)$	1	24/01/2022		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	29/01/2022		TLM1	
28.	**TUTORIAL 4**	1	31/01/2022		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	05/02/2022		TLM1	
33.	REVISION	1	14/02/2022		TLM1	
34.	Picard's Method	1	16/02/2022		TLM1	
35.	**TUTORIAL 5**	1	17/02/2022		TLM3	
36.	Euler's Method	1	18/02/2022		TLM1	
37.	Modified Euler's Method	1	19/02/2022		TLM 1	
38.	Modified Euler's Method	1	21/02/2022		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	26/02/2022		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	28/02/2022		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	05/03/2022		TLM1	
48.	**TUTORIAL 7**	1	07/03/2022		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	12/03/2022		TLM1	
53.	Maxima and Minima of functions of two variables	1	14/03/2022		TLM1	
54.	**TUTORIAL 8**	1	16/03/2022		TLM3	
No. of classes required to complete UNIT-IV:12				**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
55.	Introduction to UNIT V	1	17/03/2022		TLM1	
56.	Formation of PDE by elimination of arbitrary constants	1	18/03/2022		TLM1	
57.	Formation of PDE by elimination of arbitrary constants	1	19/03/2022		TLM1	

58.	Formation of PDE by elimination of arbitrary functions	1	21/03/2022		TLM1	
59.	Formation of PDE	1	23/03/2022		TLM1	
60.	**TUTORIAL 9**	1	24/03/2022		TLM3	
61.	Solving of PDE	1	25/03/2022		TLM1	
62.	Lagrange's Method	1	26/03/2022		TLM1	
63.	Lagrange's Method	1	28/03/2022		TLM1	
64.	**TUTORIAL 10**	1	30/03/2022		TLM3	
65.	Problems	1	31/03/2022		TLM1	
66.	**Revision**	1	31/03/2022		TLM1	
67.	**Revision**	1	01/04/2022		TLM1	

No. of classes required to complete UNIT-V: 13	**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	Dr. A. Rami Reddy	Dr. A. Rami Reddy	Dr. A. Rami Reddy	Dr. A. Rami Reddy
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.N.Aruna
Course Name & Code : Applied Physics, 20FE07
L-T-P Structure : 2-1-0   Credits : 4
Program/Sem/Sec : B.Tech., EEE, I-Sem., Section- A   A.Y : 2021-22

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts of Optics , quantum mechanics, free electron theory of metals, semi conductors,dielectrics and their applications.

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

CO 1	Define the nature of interference and diffraction (Remember - L1)
CO 2	Apply the lasers and optical fibers in different fields (Apply - L3)
CO 3	Estimate the electrical conductivity of metals (Understand - L2)
CO 4	Analyze the properties of semiconducting materials (Understand – L2)
CO5	Classify the different types of magnetic and dielectric materials (Understand - L2)

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

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

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

BOS APPROVED TEXT BOOKS:
T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.

T2 : M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd
            Edition, 2014.

BOS APPROVED REFERENCE BOOKS:
R1 : M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd
            Edition, 2007.

R2   P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.

R3   P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.

R4   Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Interference and Diffraction

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and COs Introduction to Unit-I	1	13-12-2021		TLM2	
2.	Superposition of waves, Coherence, Conditions for Interference	1	14-12-2021		TLM1	
3.	Interference from thin films	1	17-12-2021		TLM1,2	
4.	Newton's rings	1	18-12-2021		TLM1,2	
5.	Michelson's interferometer	1	20-12-2021		TLM3	
6.	Diffraction-Introduction	1	21-12-2021		TLM1,2	
7.	Single slit diffraction	1	24-12-2021		TLM2	
8.	Single slit diffraction	1	27-12-2021		TLM2	
9.	Circular aperture	1	28-12-2021		TLM1,2	
10.	Diffraction –N parallel slits and grating-Characteristics	1	31-12-2021		TLM3	
11.	Resolving power of Grating	1	03-01-2022		TLM1.2	
12.	Problems/ Assignment		04-01-2022			
No. of classes required to complete UNIT-I: 11				No. of classes taken:		

UNIT-II: Lasers and Optical fibers

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to UNIT- II	1	07-01-2022			
2.	Characteristics of Lasers,					
3.	Principle of laser, Population inversion, Meta stable state,	1	08-01-2022		TLM1	
4.	Einstein's coefficients	1	10-01-2022			
5.	Laser Components and Nd-YAG Laser	1	11-01-2022		TLM3	
	He-Ne gas laser,	1	17-01-2022		TLM2	
6.	Principle and Structure of optical fibre	1	18-01-2022		TLM2	
7.	Acceptance angle &Numerical Aperture	1	21-01-2022		TLM1	
8.	Step index and Graded index	1	22-01-2022		TLM2	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	fibers and Applications					
9.	Problems/ Assignment	1	22-01-2022		TLM3	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: Principles of Quantum Mechanics and Classical Free Electron theory of Mmetals

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-Unit III De Broglie hypothesis, Properties of matter waves	1	24-01-2022		TLM1	
2.	Davisson and Germer Experiment		25-01-2022		TLM2	
3.	Schrodinger wave equation-Time independent,dependent	1	28-01-2022		TLM2	
4.	Physical significance of wave function, Particle in a box	1	29-01-2022		TLM1	
5.	Classical free electron theory- postulates	1	07-02-2022		TLM1	
6.	drift velocity, Expression for electrical conductivity	1	08-02-2022		TLM1	
7.	Advantageous and drawbacks	1	11-02-2022		TLM1	
8.	Fermi –Dirac statistics	1	12-02-2022		TLM1	
9.	Classification of solids -band theory	1	14-02-2022		TLM2	
10.	Problems/ Assignment	1	15-02-2022		TLM2	
No. of classes required to complete UNIT-III: 10				drift velocity, Resistivity:		

UNIT-IV : Semiconductor Physics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to UNIT-IV Carrier concentration - Intrinsic semiconductor	1	18-02-2022		TLM1	
2.	Carrier concentration - Intrinsic semiconductor	1	19-02-2022		TLM1	
3.	Carrier concentration - Extrinsic semiconductor	1	21-02-2022		TLM1	
4.	Carrier concentration - Extrinsic semiconductor	1	22-02-2022		TLM1	
5.	Energy band gap of a Semiconductor	1	25-02-2022		TLM1.2	
6.	Drift and diffusion current , Einstein	1	26-02-2022		TLM3	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	relations					
7.	Hall effect	1	28-02-2022		TLM1,2	
8.	Direct band gap and indirect band gap semiconductors	1	04-03-2022		TLM1,2	
9.	Solar cell, Applications	1	05-03-2022		TLM1,2	
10.	Problems/ Assignment	1	07-03-2022		TLM5	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V :Magnetic and Dielectric materials

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to UNIT-V Magnetic parameters	1	08-03-2022		TLM1	
2.	Classification of magnetic materials	1	11-03-2022		**TLM3**	
3.	Hysteresis loop	1	12-03-2022		**TLM2**	
4.	Soft &Hard magnetic materials	1	14-03-2022			
5.	Types of polarization- Electronic polarization	1	15-03-2022		**TLM1,2**	
6.	Ionic and Orientation Polarization	1	18-03-2022		**TLM2**	
7.	Local field	1	21-03-2022		**TLM1**	
8.	Classius mosotti equation Applications	1	22-03-2022		**TLM1**	
9.	Problems/Assignment	1	25-03-2022		**TLM3**	
10.	Revision	1	26-03-2022		**TLM3**	
No. of classes required to complete UNIT-V: 10				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

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	**Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2	**VLSI and Embedded Systems:** Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools
PSO 3	**Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mrs.N.Aruna	**Dr. S.Yusub**	**Dr. S.Yusub**	**Dr. A. Rami Reddy**

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	: **B.Tech., I-Sem., EEE-B**
ACADEMIC YEAR	: **2021-22**
COURSE NAME & CODE	: **APPLIED PHYSICS & 20FE07**
L-T-P STRUCTURE	: **3-1-0**
COURSE CREDITS	: **3**
COURSE INSTRUCTOR	: **P VIJAYA SIRISHA**
PRE-REQUISITE	: **Nil**

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts ofoptics, quantum mechanics, free electron theory of metals, semiconductors, dielectrics, and their applications.

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

CO 1	**Define** the nature of Interference and Diffraction.
CO 2	**Apply** the Lasers and Optical Fibers in different fields.
CO 3	**Estimate** the electrical conductivity of metals.
CO 4	**Analyze** the properties of Semiconducting materials.
CO5	**Classify** the different types of Magnetic and Dielectric materials.

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

APPLIED PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	3	3	1	1	1	1	1	-	-	-	-	1
CO2.	3	3	2	1	1	1	1	-	-	-	-	1
CO3.	3	3	1	1	1	1	1	-	-	-	-	1
CO4.	3	3	1	1	1	1	1	-	-	-	-	1
CO5.	3	3	1	1	1	1	1	-	-	-	-	1
1 = slight (Low) **2 = Moderate (Medium)** **3 = Substantial (High)**												

BOS APPROVED TEXT BOOKS:

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.
T2 : M.N. Avadhanulu, P.G. Kshirsagar, "Engineering *Physics*", S. Chand &Co., 2nd Edition, 2014.

BOS APPROVED REFERENCE BOOKS:

R1: M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd Edition, 2007.
R2 :P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.
R3 :P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.
R4 :Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

WEB REFERENCES AND E-TEXT BOOKS

1. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
2. http://physicsdatabase.com/free-physics-books/
3. http://www.e-booksdirectory.com
4. http://www.thphys.physics.ox.ac.uk

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-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTERFERENCE & DIFFRACTION

Course Outcome :- CO 1; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	13/12/2021		**TLM2**		
2.	General Properties of Light	1	13/12/2021		**TLM5**		
3.	Recapitulation of Basic Concepts of Physics	1	14/12/2021		**TLM6**		
4.	Superposition of waves, Coherence, Conditions for Interference	1	15/12/2021		**TLM6**		

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
5.	Interference from thin films	1	17/12/2021		**TLM1**		
6.	Newton's rings	1	20/12/2021		**TLM4**		
7.	TUTORIAL-1	1	21/12/2021		**TLM3**		
8.	Michelson's interferometer	1	22/12/2021		**TLM2**		
9.	Problems &Assignment/Quiz	1	27/12/2021		**TLM1**		
10.	Introduction – Diffraction, Types	1	28/12/2021		**TLM2**		
11.	Single slit diffraction	1	29/12/2021		**TLM4**		
12.	Diffraction – Circular aperture, Diffraction grating	1	31/12/2021		**TLM4**		
13.	TUTORIAL-2	1	03/01/2022		**TLM3**		
14.	Resolving power of Grating	1	04/01/2022		**TLM1**		
15.	Problems &Assignment/Quiz	1	05/01/2022		**TLM1**		
No. of classes required to complete UNIT-I: 12			No. of classes taken:				

UNIT-II: LASERS & OPTICAL FIBERS

Course Outcome :- CO 2; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Principle of laser, Absorption, Spontaneous and Stimulated emission	1	07/01/2022		**TLM2**		
2.	Einstein Coefficients	1	10/01/2022		**TLM1**		
3.	TUTORIAL-3	1	11/01/2022		**TLM3**		
4.	Nd-YAG Laser, He-Ne gas Laser	1	12/01/2022		**TLM2**		
5.	Applications of LASERS	1	12/01/2022		**TLM5**		
6.	Optical Fiber principle, Structure of optical fiber	1	17/01/2022		**TLM2**		
7.	Numerical aperture and Acceptance angle	1	18/01/2022		**TLM4**		
8.	TUTORIAL-4	1	18/01/2022		**TLM3**		
9.	Types of optical	1	19/01/2022		**TLM2**		

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
	fibers						
10.	Applications	1	19/01/2022		**TLM5**		
No. of classes required to complete UNIT-II: 10				No. of classes taken:			

UNIT-III: PRICIPLES OF QUANTUM MECHANICS & FREE ELECTRON THEORY

Course Outcome :- CO 3; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction quantum mechanics,De Broglie hypothesis	1	21/01/2022		**TLM5**		
2.	TUTORIAL-5	1	21/01/2022		**TLM3**		
3.	Davisson and Germer Experiment,	1	24/01/2022		**TLM2**		
4.	Physical significance of wave function	1	25/01/2022		**TLM1**		
5.	Schrodinger time dependent & independent wave equations	1	28/01/2022		**TLM1**		
6.	Particle in a box	1	28/01/2022		**TLM1**		
7.	Problems &Assignment/Quiz	1	29/01/2022		**TLM3**		
8.	TUTORIAL-6	---	31/01/2022		---		
9.	PROBLEMS	---	01/02/2022		---		
10.	Classical free electron theory- postulates, Success & Failures	---	02/02/2022		---		
11.	Expression for electrical conductivity and drift velocity	---	04/02/2022		---		
12.	MID 1 EXAMS	1	07/02/2022		**TLM2**		
13.	MID 1 EXAMS		08/02/2022				
14.	MID 1 EXAMS	1	09/02/2022		**TLM3**		
15.	MID 1 EXAMS		11/02/2022				
16.	Fermi-Dirac distribution function- Temperature dependence	1	14/02/2022		**TLM2**		
17.	Classification of	1	15/02/2022		**TLM6**		

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
	Solids on the basis of Band theory						
18.	Problems &Assignment/Quiz	1	16/02/2022		**TLM1**		
No. of classes required to complete UNIT-III: 11				No. of classes taken:			

UNIT-IV :SEMICONDUCTOR PHYSICS

Course Outcome :- CO 4; Text Book :- T2, R1

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction - Classification of semiconductors	1	18/02/2022		**TLM6**		
2.	TUTORIAL-7	1	21/02/2022		**TLM3**		
3.	Conductivity of Intrinsic and Extrinsic semiconductors	1	22/02/2022		**TLM1**		
4.	Drift and Diffusion Current, Einstein relation	1	23/02/2022		**TLM1**		
5.	Hall Effect and Hall Coefficient	1	25/02/2022		**TLM5**		
6.	Direct band gap and indirect band gap semiconductors	1	25/02/2022		**TLM2**		
7.	TUTORIAL-8	1	28/02/2022		**TLM3**		
8.	Solar Cell, Applications	1	02/03/2022		**TLM4**		
9.	Problems &Assignment/Quiz	1	04/03/2022		**TLM1**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

UNIT-V :MAGNETIC & DIELECTRIC MATERIALS

Course Outcome :- CO 5; Text Book :- T2, R1

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction,Magnetic parameters	1	07/03/2022		**TLM2**		
2.	Classification of magnetic materials – Dia, para & Ferro	1	08/03/2022		**TLM6**		
3.	TUTORIAL-9	1	09/03/2022		**TLM3**		
4.	Hysteresis loop, soft and hard magnetic materials	1	11/03/2022		**TLM2**		
5.	Applications of magnetic materials	1	14/03/2022		**TLM2**		

No.	Topic	No. of classes	Date		TLM		
6.	Basic Definitions, Electronic polarization	1	15/03/2022		**TLM1**		
7.	Ionic & Orientation polarization	1	16/03/2022		**TLM1**		
8.	TUTORIAL-10	1	18/03/2022		**TLM3**		
9.	Local field, Clausius Mosotti equation	1	21/03/2022		**TLM1**		
10.	Applications of dielectricmaterials	1	22/03/2022		**TLM2**		
11.	Problems & Assignment/Quiz	1	23/03/2022		**TLM1**		
12	Revesion	1	25/03/2022				
12.	MID-2 Exams	---	28/03/2022		---		
13.	MID-2 Exams	---	29/03/2022		---		
14.	MID-2 Exams	---	31/03/2022		---		
15.	MID-2 Exams	---	01/04/2022		---		
16.	MID-2 Exams	---	02/04/2022		---		

| No. of classes required to complete UNIT-V: 11 | | No. of classes taken: | |

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
Assignment-III (Unit-III (A))	A3=5
I-Mid Examination (Units-I, II& III (A))	M-1=18
I-Quiz Examination (Units-I, II& III (A))	Q1=07
Assignment-III (Unit-III (B))	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III (B), IV & V)	M-2=18
II-Quiz Examination (Units-III (B), IV & V)	Q2=07
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=18
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=07
Cumulative Internal Examination (CIE): A+M+Q	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	**100**

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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
P Vijaya Sirisha	Dr. S. Yusub	Dr. S. Yusub	Dr. A. Rami Reddy

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: V. VENKATRAMI REDDY
Course Name & Code : BC&ME, 20CE04
L-T-P Structure : 4-0-0   Credits:
Program/Sem/Sec : B.Tech/I-Sem/A-Sec   **A.Y.:** 2021-22
PREREQUISITE: NO

COURSE EDUCATIONAL OBJECTIVES (CEOs): he main objective of this course is to know the system of forces, Centre of Gravity, Centroid principles in Engineering Mechanics, fluid mechanics concepts in basic civil engineering and thermodynamic, IC engines, steam and gas turbine principles in mechanical engineering fundamental concepts.

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

CO1	Compute the center of gravity and Centroid in simple basic structures and resolve the system of forces from free body diagrams while designing any component.
CO2	Differentiates the fluid statics and kinematic principles in fluid flows.
CO3	Understand the working principles of hydraulic turbines.
CO4	Discuss the laws of thermodynamics and working principles in Internal Combustion engines
CO5	Comprehends the working principles of steam and gas turbines.

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

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

TEXTBOOKS:

T1. S.S. Bhavikatti, Engineering Mechanics, 4th Edition, New Age International (P) Ltd, 2012.

T2. R.K.Rajput, Thermal Engineering, 6th Edition, 2007

T3. R.K.Bansal, "Fluid Mechanics and Hydraulic Machines", 9th Edition, Lakshmi publications.

REFERENCE BOOKS:

R1   N.H.Dubey, Engineering Mechanics, McGraw Hill, 2013

R2   D.S. Bedi, MP Poonia, Elements of Mechanical Engineering, 2019

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, Basic concepts of mechanics	1	13-12-2021		TLM1	
2.	Resultant of system of forces	1	14-12-2021		TLM1	
3.	Resultant of Coplanar Concurrent Force System	1	16-12-2021		TLM1	
4.	Moment of a Force, Couple	1	17-12-2021		TLM1	
5.	Varignon's Theorem	1	20-12-2021		TLM1	
6.	Problems	1	21-12-2021		TLM1	
7.	Resultant of Coplanar, Non-Concurrent Force System	1	23-12-2021		TLM1	
8.	Equilibrium of a Body Subjected to Concurrent Forces and Non-concurrent Forces	1	24-12-2021		TLM1	
9.	Free Body Diagrams	1	27-12-2021		TLM1	
10.	Lami 's Theorem	1	28-12-2021		TLM1	
11.	Concept of Centroid and Centre of gravity for simple bodies	1	30-12-2021		TLM1	
12.	Problems	1	31-12-2021		TLM1	
No. of classes required to complete UNIT-I: 12				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
13.	FLUID STATICS: Introduction, Dimensions and Units	1	03-01-2022		TLM1	
14.	Physical Properties of Fluids- Specific Gravity	1	04-01-2022		TLM1	
15.	Viscosity, Surface Tension	1	06-01-2022		TLM1	
16.	Vapour Pressure and its influence on Fluid Motion,	1	07-01-2022		TLM1	
17.	Atmospheric Gauge and Vacuum Pressure	1	10-01-2022		TLM1	
18.	Measurement of Pressure-Piezometer,	1	11-01-2022		TLM1	
19.	Working of U-Tube Manometers	1	17-01-2022		TLM1	
20.	Working of Differential Manometers	1	18-01-2022		TLM1	
21.	problems		20-01-2022		TLM1	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Stream Line, Path Line, Streak Line, Stream Tube,	1	21-01-2022		TLM1	
23	Classification of Flows	1	24-01-2022		TLM1	
24	Equation of Continuity for One Dimensional Flow	1	25-01-2022		TLM1	
No. of classes required to complete UNIT-II: 12				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
25	HYDRAULIC TURBINES Introduction, Classification of Turbines	1	27-01-2022		TLM1	
26	Working of Pelton Wheel	1	28-01-2022		TLM1	
27	Working of Francis Turbine	1	31-01-2022		TLM1	
28	Working of Kaplan Turbine	1	01-02-2022		TLM1	
29	Draft Tube Theory	1	03-02-2022		TLM1	
30	Concept of Cavitation	1	04-02-2022		TLM1	
21	Derivation of specific speed of hydraulic turbines.	1	14-02-2022		TLM1	
32	Numerical problems on specific speed	1	15-02-2022		TLM1	
33	Comparison Of among 3-types of turbines	1	17-02-2022		TLM1	
I-Mid Exams			07-02-2022 to 12-02-2022			
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV: IOT PHYSICAL DEVICES & ENDPOINTS

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	BASICS OF THERMODYNAMICS: Introduction	1	18-02-2022		TLM1	
35	System, Property, State, Path, Process, Cycle	1	21-02-2022		TLM1	
36	Laws of thermodynamics	1	22-02-2022		TLM1	
37	Energy, Internal Energy, Enthalpy,	1	24-02-2022		TLM1	
38	Specific heat, Latent heat	1	25-02-2022		TLM1	
39	Heat Engines, Refrigerator and Heat Pump	1	28-02-200		TLM1	
40	INTERNAL COMBUSTION ENGINES: Introduction	1	01-03-2022		TLM1	
41	classification, I.C engine parts and their functions,	1	03-03-2022		TLM1	
42	I.C engine Nomenclature, Applications of IC engines	1	04-02-2022		TLM1	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43	working of 4-stroke petrol & diesel engines,	1	07-03-2022		TLM1	
44	working of 2-stroke petrol &diesel engines &	1	08-03-2022		TLM1	
45	Coparision of 4 & 2 Stroke engines	1	10-03-2022		TLM1	
46	Valve and Port timing diagrams	1	11-03-2022		TLM1	
No. of classes required to complete UNIT-IV: 13				No. of classes taken:		

UNIT-V: IOT PHYSICAL SERVERS AND CLOUD OFFERINGS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47	STEAM TURBINES Introduction & Classification	1	14-03-2022		TLM1	
48	Working of impulse turbine	1	15-03-2022		TLM1	
49	Working of reaction steam	1	17-03-2022		TLM1	
50	comparison of impulse and reaction steam turbines	1	18-03-2022		TLM1	
51	Applications of steam turbines	1	21-03-2022		TLM1	
52	Classification of Gas Turbines	1	22-03-2022		TLM1	
53	Working of open cycle gas turbine (constant pressure)	1	24-03-2022		TLM1	
54	Working open closed gas turbine (constant pressure)	1	25-03-2022		TLM1	
55	Difference between open and closed cycle gas turbines	1	28-03-2022		TLM1	
56	Applications open and closed cycle gas turbines	1	29-03-2022		TLM1	
57	Working open closed gas turbine (constant volume)	1	31-03-2022		TLM1	
II-Mid Exams				04-04-2022 to 09-04-2022		
No. of classes required to complete UNIT-V: 11				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:
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

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	V.Venkatrami Reddy	V.Venkatrami Reddy	Dr.P.Vijaya Kumar	Dr.S.Pichi Reddy
Signature				

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: K.Karthik
Course Name & Code : BC&ME, 20CE04
L-T-P Structure : 4-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech/I-Sem/B-Sec **A.Y.:** 2021-22
PREREQUISITE: NO

COURSE EDUCATIONAL OBJECTIVES (CEOs): he main objective of this course is to know the system of forces, Centre of Gravity, Centroid principles in Engineering Mechanics, fluid mechanics concepts in basic civil engineering and thermodynamic, IC engines, steam and gas turbine principles in mechanical engineering fundamental concepts.

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

CO1	Compute the center of gravity and Centroid in simple basic structures and resolve the system of forces from free body diagrams while designing any component.
CO2	Differentiates the fluid statics and kinematic principles in fluid flows.
CO3	Understand the working principles of hydraulic turbines.
CO4	Discuss the laws of thermodynamics and working principles in Internal Combustion engines
CO5	Comprehends the working principles of steam and gas turbines.

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

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

TEXTBOOKS:

T1. S.S. Bhavikatti, Engineering Mechanics, 4ᵗʰEdition, New Age International (P) Ltd, 2012.

T2. R.K.Rajput, Thermal Engineering, 6th Edition, 2007

T3. R.K.Bansal, "Fluid Mechanics and Hydraulic Machines", 9th Edition, Lakshmi publications.

REFERENCE BOOKS:

R1 N.H.Dubey, Engineering Mechanics, McGraw Hill, 2013

R2 D.S. Bedi, MP Poonia, Elements of Mechanical Engineering, 2019

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, Basic concepts of mechanics	1	13-12-2021		TLM1	
2.	Resultant of system of forces	1	14-12-2021		TLM1	
3.	Resultant of Coplanar Concurrent Force System	1	15-12-2021		TLM1	
4.	Moment of a Force, Couple	1	16-12-2021		TLM1	
5.	Varignon's Theorem	1	20-12-2021		TLM1	
6.	Problems	1	21-12-2021		TLM1	
7.	Resultant of Coplanar, Non-Concurrent Force System	1	22-12-2021		TLM1	
8.	Equilibrium of a Body Subjected to Concurrent Forces and Non-concurrent Forces	1	23-12-2021		TLM1	
9.	Free Body Diagrams	1	28-12-2021		TLM1	
10.	Lami 's Theorem	1	03-01-2022		TLM1	
11.	Concept of Centroid and Centre of gravity for simple bodies	1	04-01-2022		TLM1	
12.	Problems	1	05-01-2022		TLM1	
No. of classes required to complete UNIT-I: 12				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
13.	FLUID STATICS: Introduction, Dimensions and Units	1	06-01-2022		TLM1	
14.	Physical Properties of Fluids- Specific Gravity	1	10-01-2022		TLM1	
15.	Viscosity, Surface Tension	1	11-01-2022		TLM1	
16.	Vapour Pressure and its influence on Fluid Motion,	1	12-01-2022		TLM1	
17.	Atmospheric Gauge and Vacuum Pressure	1	18-01-2022		TLM1	
18.	Measurement of Pressure-Piezometer,	1	19-01-2022		TLM1	
19.	Working of U-Tube Manometers	1	20-01-2022		TLM1	
20.	Working of Differential Manometers	1	24-01-2022		TLM1	
21.	problems		25-01-2022		TLM1	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Stream Line, Path Line, Streak Line, Stream Tube,	1	26-01-2022		TLM1	
23	Classification of Flows	1	27-01-2022		TLM1	
24	Equation of Continuity for One Dimensional Flow	1	31-01-2022		TLM1	
No. of classes required to complete UNIT-II: 12				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
25	HYDRAULIC TURBINES Introduction, Classification of Turbines	1	01-02-2022		TLM1	
26	Working of Pelton Wheel	1	02-02-2022		TLM1	
27	Working of Francis Turbine	1	03-02-2022		TLM1	
28	Working of Kaplan Turbine	1	07-02-2022		TLM1	
29	Draft Tube Theory	1	08-02-2022		TLM1	
30	Concept of Cavitation	1	09-02-2022		TLM1	
21	Derivation of specific speed of hydraulic turbines.	1	10-02-2022		TLM1	
32	Numerical problems on specific speed	1	14-02-2022		TLM1	
33	Comparison Of among 3-types of turbines	1	15-02-2022		TLM1	
I-Mid Exams			07-02-2022 to 12-02-2022			
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV: IOT PHYSICAL DEVICES & ENDPOINTS

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	BASICS OF THERMODYNAMICS: Introduction	1	16-02-2022		TLM1	
35	System, Property, State, Path, Process, Cycle	1	17-02-2022		TLM1	
36	Laws of thermodynamics	1	21-02-2022		TLM1	
37	Energy, Internal Energy, Enthalpy,	1	22-02-2022		TLM1	
38	Specific heat, Latent heat	1	23-02-2022		TLM1	
39	Heat Engines, Refrigerator and Heat Pump	1	24-02-200		TLM1	
40	INTERNAL COMBUSTION ENGINES: Introduction	1	28-02-2022		TLM1	
41	classification, I.C engine parts and their functions,	1	01-03-2022		TLM1	
42	I.C engine Nomenclature, Applications of IC engines	1	02-03-2022		TLM1	

43	working of 4-stroke petrol & diesel engines,	1	03-03-2022		TLM1	
44	working of 2-stroke petrol &diesel engines &	1	07-03-2022		TLM1	
45	Coparision of 4 & 2 Stroke engines	1	08-03-2022		TLM1	
46	Valve and Port timing diagrams	1	09-03-2022		TLM1	
No. of classes required to complete UNIT-IV: 13				No. of classes taken:		

UNIT-V: IOT PHYSICAL SERVERS AND CLOUD OFFERINGS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47	STEAM TURBINES Introduction & Classification	1	10-03-2022		TLM1	
48	Working of impulse turbine	1	14-03-2022		TLM1	
49	Working of reaction steam	1	15-03-2022		TLM1	
50	comparison of impulse and reaction steam turbines	1	16-03-2022		TLM1	
51	Applications of steam turbines	1	17-03-2022		TLM1	
52	Classification of Gas Turbines	1	21-03-2022		TLM1	
53	Working of open cycle gas turbine (constant pressure)	1	22-03-2022		TLM1	
54	Working open closed gas turbine (constant pressure)	1	23-03-2022		TLM1	
55	Difference between open and closed cycle gas turbines	1	24-03-2022		TLM1	
56	Applications open and closed cycle gas turbines	1	28-03-2022		TLM1	
57	Working open closed gas turbine (constant volume)	1	29-03-2022		TLM1	
II-Mid Exams				04-04-2022 to 09-04-2022		
No. of classes required to complete UNIT-V: 11				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:
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

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	K.Karthik	V.Venkatrami Reddy	Dr.P.Vijaya Kumar	Dr.S.Pichi Reddy
Signature				

LAKKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
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NAAC Accredited with 'A' grade, Accredited by NBA, Certified by ISO 9001:2015)
L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM   : B.Tech., I-Sem., EEE

ACADEMIC YEAR   : 2021-22

COURSE NAME & CODE   : Electronic Circuits and Devices 20EE03

L-T-P STRUCTURE   : 2-1-0

COURSE CREDITS   : 3

COURSE INSTRUCTOR   : Mr.P.Deepak Reddy

COURSE COORDINATOR : Mr.P.Deepak Reddy

PRE-REQUISITE: Applied Physics

COURSE OBJECTIVE : This course enables the student to interpret the concepts of basic and special semiconductor devices and their applications.

Course Outcomes: At the end of the course, the student will be able to:
CO1 : Illustrate the working of different types of diodes and their characteristics (Understand-L2)
CO2 : Analyze the operation of diode rectifiers with filters(Understand-L2)
CO3 : Understand the working and characteristics of various transistor configurations. (Understand-L2)
CO4: Analyze the transistor biasing, stabilization and amplification circuits. (Understand-L2)

<table>
<tr><td colspan="18">Mappings of course outcomes (COs) with programme outcomes (POs) & PSOs –
17EE01 – ELECTRONIC CIRCUITS AND DEVICES</td></tr>
<tr><td colspan="2" rowspan="2"></td><td colspan="12">Pos</td><td colspan="4">PSOs</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>H</td><td>i</td><td>j</td><td>k</td><td>l</td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td></tr>
<tr><td rowspan="4">COs</td><td>CO1</td><td>3</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td></td><td>3</td><td></td></tr>
<tr><td>CO2</td><td>3</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td></td><td>3</td><td></td></tr>
<tr><td>CO3</td><td>3</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td>3</td><td></td></tr>
<tr><td>CO4</td><td>3</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td>3</td><td></td></tr>
<tr><td colspan="18">1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)</td></tr>
</table>

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

BOS APPROVED TEXT BOOKS:
T1 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson/Prentice Hall,9th Edition,2006

T2 Jacob Millman, Christos C Halkias and SatyabrataJit, Millman's Electronic Devices and Circuits, Tata McGraw Hill, Second Edition, New Delhi, 2008.

BOS APPROVED REFERENCE BOOKS:
R1 S Salivahanan, N.Suresh Kumar and A Vallavaraj, Electronic Devices and Circuits, McGraw Hill, 5th edition, 2010.
R2 J.B Gupta Electronic Devices and Circuits, S.K. Kataria&Sons, 2ndEdition,2013.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I : JUNCTION DIODE CHARACTERISTICS

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 Subject & Course Outcomes	1	13-12-2021		TLM1	CO 1	T1, T2	
2.	Review of Semiconductor Physics	1	14-12-2021		TLM2	CO 1	T1, T2	
3.	N and P type Semiconductors	1	15-12-2021		TLM1	CO 1	T1, T2	
4.	Mass action law and continuity equation	1	16-12-2021		TLM1	CO 1	T1, T2	
5.	Hall effect	1	17-12-2021		TLM8	CO 1	T1, T2	
6.	TUTORIAL-1	1	20-12-2021		TLM1	CO 1	T1, T2	
7.	Fermi level of Semiconductors, Energy band diagram of PN diode	1	21-12-2021		TLM1	CO 1	T1, T2	
8.	PN diode biasing, V-I characteristics	1	22-12-2021		TLM3	CO 1		
9.	Current components, Diode equation,	1	23-12-2021		TLM1	CO 1	T1, T2	
10.	Transition and Diffusion capacitances and problems	1	24-12-2021		TLM1	CO 1	T1, T2	
11.	TUTORIAL-2	1	27-12-2021		TLM1	CO 1	T1, T2	
12.	Temperature dependence of V-I characteristics ,	1	28-12-2021		TLM1	CO 1	T1, T2	
13.	Breakdown mechanisms in PN diode	1	29-12-2021		TLM3	CO 1		
14.	Zener diode	1	30-12-2021		TLM1	CO 1	T1, T2	
15.	Tunnel Diode, Varactor diode	1	31-12-2021		TLM1	CO 1	T1, T2	
16.	Numerical Problems	1	3-1-2022		TLM1	CO 1	T1, T2	
17	Assignment/Quiz-1	1	4-1-2022		TLM3	CO 1		
No. of classes required to complete UNIT-I		17			No. of classes taken: 18			

UNIT-II : RECTIFIERS AND FILTERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Half wave Rectifier	1	5-1-2022		TLM1	CO 2	T1, T2	
19.	Full wave Rectifier	1	6-1-2022		TLM1	CO 2	T1, T2	
20.	Bridge Rectifier	1	7-1-2022		TLM1	CO 2	T1, T2	
21.	TUTORIAL-3	1	10-1-2022		TLM1	CO 2	T1, T2	
22.	Ripple factor, Harmonic components in Rectifiers	1	11-1-2022		TLM1	CO 2	T1, T2	

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
23.	Inductor filter and capacitor filter	1	18-1-2022		TLM4	CO 2	T1, T2	
24.	L-section filter, Π- section filter and	1	19-1-2022		TLM3	CO 2		
25.	multiple L- section filter, Multiple Π-section filter	1	20-1-2022		TLM1	CO 2	T1, T2	
26.	comparison of various filter circuits	1	21-1-2022		TLM1	CO 2	T1, T2	
27.	TUTORIAL-4	1	24-1-2022		TLM1	CO 2	T1, T2	
28.	Basics of Regulators	1	25-1-2022		TLM1	CO 2	T1, T2	
29.	Assignment/Quiz-2	1	27-1-2022		TLM3	CO 2		
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III : TRANSISTOR AND FET CHARACTERISTICS

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
30.	Junction Transistor, Transistor as an amplifier	1	28-1-2022		TLM1	CO 1	T1, T2	
31.	TUTORIAL-5	1	31-1-2022		TLM1	CO 1	T1, T2	
32.	Transistor construction	1	1-2-2022		TLM1	CO 1	T1, T2	
33.	Transistor Current components	1	2-2-2022		TLM1	CO 1	T1, T2	
34.	Input and Output characteristics of Transistor in Common Base configurations	1	3-2-2022		TLM1	CO 1	T1, T2	
35.	Common Emitter configuration	1	4-2-2022		TLM3	CO 1		
36.	**I Mid Exams**		**07-2-2022**	**12-2-2022**				
37.	TUTORIAL-6	1	14-2-2022		TLM1	CO 1	T1, T2	
38.	common collector configuration	1	15-2-2022		TLM1	CO 1	T1, T2	
39.	Common collector configuration, Comparison of Transistor Configurations	1	16-2-2022		TLM1	CO 1	T1, T2	
40.	Relation between alpha, beta and gama	1	17-2-2022		TLM3	CO 1		
41.	Small signal model of Transistor	1	18-2-2022		TLM1	CO 1	T1, T2	
42.	TUTORIAL-7	1	21-2-2022		TLM1	CO 1	T1, T2	
43.	FET characteristics	1	22-2-2022		TLM1	CO 1	T1, T2	
44.	Repitition	1	23-2-2022		TLM1	CO 1	T1, T2	
45.	Assignment/Quiz-3	1	24-2-2022		TLM3	CO 1		
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV : BIASING AND STABILISATION

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
46.	BJT biasing	1	25-2-2022		TLM1	CO 3	T1, T2	
47.	TUTORIAL-8	1	28-2-2022		TLM1	CO 3	T1, T2	
48.	DC equivalent model	1	1-3-2022		TLM1	CO 3	T1, T2	
49.	Criteria for fixing operating point, Fixed bias	1	2-3-2022		TLM3	CO 3		
50.	Collector to base bias and self bias	1	3-3-2022		TLM1	CO 3	T1, T2	
51.	Stabilization factors(S,S',S")	1	4-3-2022		TLM1	CO 3	T1, T2	
52.	TUTORIAL-9	1	7-3-2022		TLM1	CO 3	T1, T2	
53.	Compensation techniques against variation in V_{BE}	1	8-3-2022		TLM1	CO 3	T1, T2	
54.	Compensation techniques against variation in I_{c0}	1	9-3-2022		TLM3	CO 3		
55.	Thermal runaway, Thermal stability	1	10-3-2022		TLM1	CO 3	T1, T2	
56.	FET biasing	1	11-3-2022		TLM1	CO 3	T1, T2	
57.	TUTORIAL-10	1	14-3-2022		TLM1	CO 3	T1, T2	
58.	Assignment/Quiz-4	1	15-3-2022		TLM1	CO 3	T1, T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V : AMPLIFIERS

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
59.	Small signal low frequency transistor amplifiers circuits	1	16-3-2022		TLM1	CO 1	T1, T2	
60.	h-parameters representation of a transistor	1	17-3-2022		TLM1	CO 1	T1, T2	
61.	TUTORIAL-11	1	21-3-2022		TLM1	CO 1	T1, T2	
62.	h-parameters representation of a transistor	1	22-3-2022		TLM1	CO 1	T1, T2	
63.	Analysis of single stage transistor amplifier using h-parameters	1	23-3-2022		TLM3	CO 1		
64.	Voltage gain, Current gain, Input Impedance and Output Impedance	1	24-3-2022		TLM1	CO 1	T1, T2	
65.	Comparisons of transistor parameters A_I,R_i,A_v,R_o	1	25-3-2022		TLM1	CO 1	T1, T2	
66.	TUTORIAL-12	1	28-3-2022		TLM1	CO 1	T1, T2	
67.	FET amplifier	1	29-3-2022		TLM1	CO 1	T1, T2	
68.	CD ,CS configuration	1	30-3-2022		TLM3	CO 1		
69.	Repitition	1	31-3-2022		TLM1	CO 1	T1, T2	

70.	Assignment/Quiz-5	1	1-4-2022		TLM1	CO 1	T1, T2	
No. of classes required to complete UNIT-V		12			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
71.	Oscillators Introduction	1			TLM1			
72.	Introduction to Digital Electronics	1			TLM1			

Teaching Learning Methods

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-12-2021	05-02-2022	7 W
I Mid Examinations	07-02-2022	12-02-2022	1 W
II Phase of Instructions	14-02-2022	02-02-2022	9 W
II Mid Examinations	04-04-2022	09-04-2022	1 W
Preparation and Practicals	18-04-2022	30-04-2022	1 1/2 W
Semester End Examinations			1 1/2 W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment-1	1,2	A1=5
I-Mid Examination	1,2	B1=15
Quiz Marks-1	1,2	C1=10
Assignment-2	3,4	A2=5
II-Mid Examination	3,4	B2=15
Quiz Marks-2	3,4	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2)/2	1,2,3,4	A=5
Evaluation of Mid Marks: B=80% of Max(B1,B2)+20% of Min(B1,B2)	1,2,3,4	B=20
Evaluation of Quiz Marks: B=80% of Max(C1,C2)+20% of Min(C1,C2)	1,2,3,4	C=10
Cumulative Internal Examination : A+B+C+D	**1,2,3,4**	**A+B+C=30**
Semester End Examinations	**1,2,3,4**	**E=70**
Total Marks: A+B+C+D+E	**1,2,3,4**	**100**

PEOs(Program Educational Objectives):

PEO1. Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.

PEO2. Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.

PEO3. Work effectively as individuals and as team members in multidisciplinary projects.

PEO4.Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

POs:(Program Outcomes)

a: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b:. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c: 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.

d: 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.

e: 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.

f: 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.

g: 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.

h: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i:Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j: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.

k: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.

l: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.

PSOs(Program Specific Outcomes)

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

Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

LAKKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,
NAAC Accredited with 'A' grade, Accredited by NBA, Certified by ISO 9001:2015)
L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM   : B.Tech., I-Sem., EEE

ACADEMIC YEAR   : 2021-22

COURSE NAME & CODE : Electronic Circuits and Devices 20EE03

L-T-P STRUCTURE   : 2-1-0

COURSE CREDITS   : 3

COURSE INSTRUCTOR   : Mr.P.Deepak Reddy

COURSE COORDINATOR : Mr.P.Deepak Reddy

PRE-REQUISITE: nil

COURSE OBJECTIVE : This course enables the student to interpret the concepts of basic and special semiconductor devices and their applications.

Course Outcomes: At the end of the course, the student will be able to:
CO1 : Illustrate the working of different types of diodes and their characteristics (Understand-L2)
CO2 : Analyze the operation of diode rectifiers with filters(Understand-L2)
CO3 : Understand the working and characteristics of various transistor configurations. (Understand-L2)
CO4: Analyze the transistor biasing, stabilization and amplification circuits. (Understand-L2)

Mappings of course outcomes (COs) with programme outcomes (POs) & PSOs – 17EE01 – ELECTRONIC CIRCUITS AND DEVICES																
		Pos											PSOs			
		a	b	c	d	e	f	g	H	i	j	k	l	PSO1	PSO2	PSO3	PSO4
COs	CO1	3				2							1	2		3	
	CO2	3				2							1	2		3	
	CO3	3				2								2		3	
	CO4	3				2								2		3	
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)																

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

BOS APPROVED TEXT BOOKS:
T1 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson/Prentice Hall,9th Edition,2006

T2 Jacob Millman, Christos C Halkias and SatyabrataJit, Millman's Electronic Devices and Circuits, Tata McGraw Hill, Second Edition, New Delhi, 2008.

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R2 J.B Gupta Electronic Devices and Circuits, S.K. Kataria&Sons, 2ndEdition,2013.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I : JUNCTION DIODE CHARACTERISTICS

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 Subject & Course Outcomes	1	13-12-2021		TLM1	CO 1	T1, T2	
2.	Review of Semiconductor Physics	1	14-12-2021		TLM2	CO 1	T1, T2	
3.	N and P type Semiconductors	1	16-12-2021		TLM1	CO 1	T1, T2	
4.	Mass action law and continuity equation	1	17-12-2021		TLM1	CO 1	T1, T2	
5.	Hall effect	1	18-12-2021		TLM8	CO 1	T1, T2	
6.	TUTORIAL-1	1	20-12-2021		TLM1	CO 1	T1, T2	
7.	Fermi level of Semiconductors, Energy band diagram of PN diode	1	21-12-2021		TLM1	CO 1	T1, T2	
8.	PN diode biasing, V-I characteristics	1	23-12-2021		TLM3	CO 1		
9.	Current components, Diode equation,	1	24-12-2021		TLM1	CO 1	T1, T2	
10.	TUTORIAL-2	1	27-12-2021		TLM1	CO 1	T1, T2	
11.	Transition and Diffusion capacitances and problems	1	28-12-2021		TLM1	CO 1	T1, T2	
12.	Temperature dependence of V-I characteristics ,	1	30-12-2021		TLM1	CO 1	T1, T2	
13.	Breakdown mechanisms in PN diode	1	31-12-2021		TLM3	CO 1		
14.	Zener diode, Numerical Problems	1	3-1-2022		TLM1	CO 1	T1, T2	
15.	Tunnel Diode, Varactor diode Assignment/Quiz-1	1	4-1-2022		TLM1	CO 1	T1, T2	
No. of classes required to complete UNIT-I		15			No. of classes taken: 18			

UNIT-II : RECTIFIERS AND FILTERS

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
16.	Half wave Rectifier	1	6-1-2022		TLM1	CO 2	T1, T2	
17.	Full wave Rectifier	1	7-1-2022		TLM1	CO 2	T1, T2	
18.	Bridge Rectifier	1	8-1-2022		TLM1	CO 2	T1, T2	
19.	TUTORIAL-3	1	10-1-2022		TLM1	CO 2	T1, T2	
20.	Ripple factor, Harmonic components in Rectifiers	1	11-1-2022		TLM1	CO 2	T1, T2	
21.	Inductor filter and capacitor filter	1	18-1-2022		TLM4	CO 2	T1, T2	

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
22.	L-section filter, Π- section filter and	1	20-1-2022		TLM3	CO 2		
23.	multiple L- section filter, Multiple Π-section filter	1	21-1-2022		TLM1	CO 2	T1, T2	
24.	comparison of various filter circuits	1	22-1-2022		TLM1	CO 2	T1, T2	
25.	TUTORIAL-4	1	24-1-2022		TLM1	CO 2	T1, T2	
26.	Basics of Regulators	1	25-1-2022		TLM1	CO 2	T1, T2	
27.	Assignment/Quiz-2	1	27-1-2022		TLM3	CO 2		
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III : TRANSISTOR AND FET CHARACTERISTICS

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.	Junction Transistor, Transistor as an amplifier	1	28-1-2022		TLM1	CO 1	T1, T2	
29.	Transistor construction	1	29-1-2022		TLM1	CO 1	T1, T2	
30.	TUTORIAL-5	1	31-1-2022		TLM1	CO 1	T1, T2	
31.	Transistor Current components	1	1-2-2022		TLM1	CO 1	T1, T2	
32.	Input and Output characteristics of Transistor in Common Base configurations	1	3-2-2022		TLM1	CO 1	T1, T2	
33.	Common Emitter configuration	1	4-2-2022		TLM3	CO 1		
34.	**I Mid Exams**		07-2-2022	12-2-2022				
35.	TUTORIAL-6	1	14-2-2022		TLM1	CO 1	T1, T2	
36.	common collector configuration	1	15-2-2022		TLM1	CO 1	T1, T2	
37.	Common collector configuration, Comparison of Transistor Configurations	1	17-2-2022		TLM1	CO 1	T1, T2	
38.	Relation between alpha, beta and gama	1	18-2-2022		TLM3	CO 1		
39.	Small signal model of Transistor	1	19-2-2022		TLM1	CO 1	T1, T2	
40.	TUTORIAL-7	1	21-2-2022		TLM1	CO 1	T1, T2	
41.	FET characteristics	1	22-2-2022		TLM1	CO 1	T1, T2	
42.	Repitition	1	24-2-2022		TLM1	CO 1	T1, T2	
43.	Assignment/Quiz-3	1	25-2-2022		TLM3	CO 1		
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV : BIASING AND STABILISATION

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
44.	BJT biasing	1	26-2-2022		TLM1	CO 3	T1, T2	
45.	TUTORIAL-8	1	28-2-2022		TLM1	CO 3	T1, T2	
46.	DC equivalent model	1	1-3-2022		TLM1	CO 3	T1, T2	
47.	Criteria for fixing operating point, Fixed bias	1	3-3-2022		TLM3	CO 3		
48.	Collector to base bias and self bias	1	4-3-2022		TLM1	CO 3	T1, T2	
49.	Stabilization factors(S,S',S")	1	5-3-2022		TLM1	CO 3	T1, T2	
50.	TUTORIAL-9	1	7-3-2022		TLM1	CO 3	T1, T2	
51.	Compensation techniques against variation in V_{BE}	1	8-3-2022		TLM1	CO 3	T1, T2	
52.	Compensation techniques against variation in I_{c0}	1	10-3-2022		TLM3	CO 3		
53.	Thermal runaway, Thermal stability	1	11-3-2022		TLM1	CO 3	T1, T2	
54.	FET biasing	1	12-3-2022		TLM1	CO 3	T1, T2	
55.	TUTORIAL-10	1	14-3-2022		TLM1	CO 3	T1, T2	
56.	Assignment/Quiz-4	1	15-3-2022		TLM1	CO 3	T1, T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V : AMPLIFIERS

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
57.	Small signal low frequency transistor amplifiers circuits	1	17-3-2022		TLM1	CO 1	T1, T2	
58.	h-parameters representation of a transistor	1	19-3-2022		TLM1	CO 1	T1, T2	
59.	TUTORIAL-11	1	21-3-2022		TLM1	CO 1	T1, T2	
60.	h-parameters representation of a transistor	1	22-3-2022		TLM1	CO 1	T1, T2	
61.	Analysis of single stage transistor amplifier using h-parameters	1	24-3-2022		TLM3	CO 1		
62.	Voltage gain, Current gain, Input Impedance and Output Impedance	1	25-3-2022		TLM1	CO 1	T1, T2	
63.	Comparisons of transistor parameters A_I, R_i, A_v, R_o	1	26-3-2022		TLM1	CO 1	T1, T2	
64.	TUTORIAL-12	1	28-3-2022		TLM1	CO 1	T1, T2	
65.	FET amplifier	1	29-3-2022		TLM1	CO 1	T1, T2	
66.	CD ,CS configuration	1	31-3-2022		TLM3	CO 1		
67.	Assignment/Quiz-5	1	1-4-2022		TLM1	CO 1	T1, T2	

No. of classes required to complete UNIT-V	11			No. of classes taken:

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
68.	Oscillators Introduction	1			TLM1			
69.	Introduction to Digital Electronics	1			TLM1			

Teaching Learning Methods

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-12-2021	05-02-2022	7 W
I Mid Examinations	07-02-2022	12-02-2022	1 W
II Phase of Instructions	14-02-2022	02-02-2022	9 W
II Mid Examinations	04-04-2022	09-04-2022	1 W
Preparation and Practicals	18-04-2022	30-04-2022	1 1/2 W
Semester End Examinations			1 1/2 W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment-1	1,2	A1=5
I-Mid Examination	1,2	B1=15
Quiz Marks-1	1,2	C1=10
Assignment-2	3,4	A2=5
II-Mid Examination	3,4	B2=15
Quiz Marks-2	3,4	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2)/2	1,2,3,4	A=5
Evaluation of Mid Marks: B=80% of Max(B1,B2)+20% of Min(B1,B2)	1,2,3,4	B=20
Evaluation of Quiz Marks: B=80% of Max(C1,C2)+20% of Min(C1,C2)	1,2,3,4	C=10
Cumulative Internal Examination : A+B+C+D	**1,2,3,4**	**A+B+C=30**
Semester End Examinations	**1,2,3,4**	**E=70**
Total Marks: A+B+C+D+E	**1,2,3,4**	**100**

PEOs(Program Educational Objectives):

PEO1. Design and develop innovative products and services in the field of Electrical and Electronics

Engineering and allied engineering disciplines.

PEO2. Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance,

pursue higher education and research.

PEO3. Work effectively as individuals and as team members in multidisciplinary projects.

PEO4.Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

POs:(Program Outcomes)

a: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b:. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c: 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.

d: 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.

e: 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.

f: 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.

g: 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.

h: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i:Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j: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.

k: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.

l: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.

PSOs(Program Specific Outcomes)

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

Course Instructor   **Course Coordinator**   **Module Coordinator**   **HOD**

COURSE HANDOUT

Part-A

PROGRAM	:	B.Tech., I-Sem.,EEE -A
ACADEMIC YEAR	:	2021-22
COURSE NAME & CODE	:	APPLIED PHYSICS LAB -20 FE54
L-T-P STRUCTURE	:	0-0 -3
COURSE CREDITS	:	1.5
COURSE INSTRUCTOR	:	**Mrs.N.Aruna**
COURSE COORDINATOR	:	**Dr S.Yusub**

Pre-requisites : NIL

Course Educational Objective : This course enables the students to acquire theoretical ideas, Analytical techniques and graphical analysis by completing a host of experiments with the procedures and observational skills for appropriate use of simple and complex apparatus.

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

Co1.	Analyze the wave characteristics of Light.
Co2.	Estimate the magnetic field using Stewart's and Gee's apparatus
Co3.	Verify the characteristics of Semiconductor Diodes.
Co4.	Determine the acceptance angle and numerical aperture of optical fibre.
Co 5.	Improve report writing skills, Individual and team work with Ethical values

COURSE ARTICULATION MATRIX (Correlation between Cos & POs, PSOs

Applied Physics Lab													
COURSE DESIGNED BY	FRESHMAN ENGINEERING DEPARTMENT												
Course Outcomes	**Programme Outcomes**												
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**1**	**1**								**1**
CO2.	**3**	**3**	**1**	**1**								**1**
CO3.	**3**	**3**	**1**	**1**								**1**
CO4.	**3**	**3**	**1**	**1**								**1**
CO5.								**2**	2	**2**		
CATEGORY	BASIC SCIENCES												
APPROVAL	APPROVED BY ACADEMIC COUNCIL, 2017.												

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:

1. Lab Manual Prepared by the LBRCE

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- B

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	CEO'S &CO'S Introduction	3	13-12-2021		**TLM4**	1,2,3,4	T1	
2.	Demonstration	3	20-12-2021		**TLM4**	CO1, CO2, CO3, CO4	T1	
3.	Experiment 1	3	27-12-2021		**TLM4**	CO1, CO2, CO3, CO4	T1	
4.	Experiment 2	3	03-01-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
5.	Experiment 3	3	10-01-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
6.	Experiment 4	3	17-01-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
7.	Experiment 5	3	24-01-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
8.	Demonstration	3	31-01-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
9.	Experiment 6	3	07-02-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
10.	Experiment 7	3	14-02-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
11.	Experiment 8	3	21-02-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
12.	Experiment 9	3	07-03-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
13.	Revision	3	14-03-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
14.	**Internal Exam**	3	21-03-2022					
No. of classes required to complete lab	42				No. of classes taken: 42			

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

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

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

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

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

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

(1). **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

(2). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

(5). **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

(9). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

(10). **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to

(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools

(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

N.Aruna/P V Sirisha	Dr S.Yusub	Dr S.Yusub	Dr A. Ramireddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,
NAAC Accredited with 'A' grade, Accredited by NBA, Certified by ISO 9001:2015)
L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM	:	B.Tech., I-Sem., (EEE/B)
ACADEMIC YEAR	:	2021-2022
COURSE NAME & CODE	:	APPLIED PHYSICS LAB & 20 FE 54
L-T-P STRUCTURE	:	0-0-3
COURSE CREDITS	:	1
COURSE INSTRUCTOR	:	P.Vijaya Sirisha/ N ARUNA
COURSE COORDINATOR	:	Dr. S. YUSUB

Course Educational Objective:
>The theoretical ideas, Analytical techniques, graphical analysis and concepts covered in the lecture by completing a host of experiments with the procedures and observational skills for appropriate use of simple and complex apparatus.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Analyze the wave characteristics of light.
CO2: Estimate the magnetic field using Stewart's and Gee's apparatus.
CO3: Verify the characteristics of semi conductor diodes.
CO4: Determine the acceptance angle and numerical aperture of optical fiber.
CO5: Improve report writing skills and individual team work with ethical values.

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

Applied Physics Lab													
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**												
Course Outcomes	**Programme Outcomes**												
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
CO1.	3	3	1	1								1	
CO2.	3	3	1	1								1	
CO3.	3	3	1	1								1	
CO4.	3	3	1	1								1	
CO5.								2	2	2			
1 = slight (Low)		**2 = Moderate (Medium)**				**3 = Substantial (High)**							

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

BOS APPROVED TEXT BOOKS:
1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- ECE-C

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	3	15-12-2021		**TLM4**	1,2,3,4	T1	
2.	Demonstration	3	22-12-2021		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
3.	Experiment 1	3	29-12-2021		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
4.	Experiment 2	3	05-01-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
5.	Experiment 3	3	19-01-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
6.	Experiment 4	3	02-02-2022		**TLM4**	CO1, CO2, CO3, CO4	T1	
7.	Experiment 5	3	16-02-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
8.	Experiment 6	3	23-02-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
9.	Experiment 7	3	02-03-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
10.	Experiment 8	3	09-03-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
11.	Experiment 9	3	16-03-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
12.	Experiment 10	3	23-03-2022		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
13.	**Internal Exam**	3	30-03-2022					
No. of classes required to complete UNIT-I	39			No. of classes taken:				

EVALUATION PROCESS:

Evaluation Task	Expt. no's	Marks
Day to Day work = **A**	1,2,3,4,5,6,7,8	A=20
Internal test = **B**	1,2,3,4,5,6,7,8	B=10

Evaluation of viva voce = **C**	1,2,3,4,5,6,7,8	C = 5
Evaluation of attendance Marks = **D**	1,2,3,4,5,6,7,8	D = 5
Cumulative Internal Examination : A + B + C + D = 40	1,2,3,4,5,6,7,8	**40**
Semester End Examinations = E	1,2,3,4,5,6,7,8	**E = 60**
Total Marks: A + B + C + D + E = 100	1,2,3,4,5,6,7,8	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1.To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
2. To Function professionally in the rapidly changing world with advances in technology.
3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
4. To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner .

PROGRAM OUTCOMES:

Engineering Graduates will be able to:
(**1**). **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
(**2**). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
(**3**). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
(**4**). **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
(**5**). **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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**). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
(**9**). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
(**10**). **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
(**11**). **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to

(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools

(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

P VIJAYA SIRISHA / N ARUNA	Dr. S. YUSUB	Dr. S. YUSUB	Dr A. RAMI REDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: V.VENKATRAMI REDDY
Course Name & Code : BCME Lab & 20CE53   **Regulation**: R20
L-T-P Structure : 0-0-2   **Credits: 1**
Program/Sem/Sec : B.Tech/I/A   **A.Y.:** 2021-22

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

CO1	Find the Viscosity of different oils using Viscometers.
CO2	Analyze valve and port timing diagrams in I.C engines.
CO3	Determine the performance parameters of hydraulic turbines.
CO4	Conduct the Reynolds experiment to decide the flow classification.
CO5	Evaluate Bernoulli's principles in pipe flows.

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

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

TEXTBOOKS: Lab Manuals

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Lab Demonstration	2	18-12-2021		TLM4	
2.	Determination of Radius of Gyration using compound pendulum.	2	08-01-2022		TLM4	
3.	Determination of Radius of Gyration using bifilar suspension.	2	22-01-2022		TLM4	
4.	Determination of viscosity of given oil using Redwood viscometer	2	29-01-2022		TLM4	
5.	Determination of Flash and Fire points of a given oil using ABEL'S apparatus.	2	05-02-2022		TLM4	

6.	Valve timing diagram for single cylinder, four stroke water cooled Diesel engine.	2	19-02-2022		TLM4	
7.	Port timing diagram for single cylinder, two stroke air cooled Diesel engine.	2	26-02-2022		TLM4	
8.	Verification of Bernoulli's Theorem	2	05-03-2022		TLM4	
9.	Impact of jets on Vanes.	2	12-03-2022		TLM4	
10.	Performance Test on Pelton Wheel.	2	19-03-2022		TLM4	
11.	Determination of Friction factor in a pipe line	2	26-03-2022		TLM4	
12.	Repetition	2	02-04-2022		TLM4	
No. of classes required to complete 24				**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	Expt. no's	Marks
Day to Day work = **A**	1, 2,3,4,5,6,7,8…	A=05
Record = **B**	1,2,3,4,5,6,7,8	B=05
Internal Test = **C**	1,2,3,4,5,6,7,8	C = 05
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8	**15**
Semester End Examinations = D	1,2,3,4,5,6,7,8	**D = 35**
Total Marks: A + B + C + D = 50	1,2,3,4,5,6,7,8	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge:
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

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	V.Venkatrami Reddy	V.Venkatrami Reddy	Dr.P.Vijaya Kumar	Dr.S.Pichi Reddy
Signature				

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: K.KARTHIK
Course Name & Code : BCME Lab & 20CE53   **Regulation**: R20
L-T-P Structure   : 0-0-2   **Credits: 1**
Program/Sem/Sec   : B.Tech/I/B   **A.Y.:** 2021-22

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

CO1	Find the Viscosity of different oils using Viscometers.
CO2	Analyze valve and port timing diagrams in I.C engines.
CO3	Determine the performance parameters of hydraulic turbines.
CO4	Conduct the Reynolds experiment to decide the flow classification.
CO5	Evaluate Bernoulli's principles in pipe flows.

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

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

TEXTBOOKS: Lab Manuals

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Lab Demonstration	2	16-12-2021		TLM4	
2.	Determination of Radius of Gyration using compound pendulum.	2	23-12-2021		TLM4	
3.	Determination of Radius of Gyration using bifilar suspension.	2	30-12-2021		TLM4	
4.	Determination of viscosity of given oil using Redwood viscometer	2	06-01-2022		TLM4	
5.	Determination of Flash and Fire points of a given oil using ABEL'S apparatus.	2	20-01-2022		TLM4	
6.	Valve timing diagram for single cylinder, four stroke water cooled Diesel engine.	2	27-01-2022		TLM4	
7.	Port timing diagram for single cylinder, two stroke air cooled Diesel engine.	2	03-02-2022		TLM4	
8.	Verification of Bernoulli's Theorem	2	17-02-2022		TLM4	
9.	Impact of jets on Vanes.	2	24-02-2022		TLM4	
10.	Performance Test on Pelton Wheel.	2	03-03-2022		TLM4	
11.	Calibration of Turbine Flow meter.	2	10-03-2022		TLM4	
12.	Repetition	2	17-03-2022		TLM4	
No. of classes required to complete 24				**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	Expt. no's	Marks
Day to Day work = **A**	1, 2,3,4,5,6,7,8…	A=05
Record = **B**	1,2,3,4,5,6,7,8	B=05
Internal Test = **C**	1,2,3,4,5,6,7,8	C = 05
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8	**15**
Semester End Examinations = D	1,2,3,4,5,6,7,8	**D = 35**
Total Marks: A + B + C + D = 50	1,2,3,4,5,6,7,8	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge:
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

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	K.Karthik	V.Venkatrami Reddy	Dr.P.Vijaya Kumar	Dr.S.Pichi Reddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.Deepak Reddy, Mr. Imran Abdul, Smt.T.Naga Durga.
Course Name & Code : Electronic Circuits and Devices Lab & 20EE53
L-T-P Structure : 0-0-3   **Credits:** 1
Program/Sem/Sec : B.Tech., I-Sem., EEE – A section   **A.Y.:** 2021-22

PREREQUISITE: None

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This lab course enables the student to demonstrate characteristics of semiconductor devices.

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

CO1	Analyze the characteristics of semi-conductor devices
CO2	Identify a suitable electronic circuit for a particular application
CO3	Design transistor amplifier circuits

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2			2	-	-	2	2	2	1	1	2	-	3	2
CO2	3	2	-		2	-	-	2	2	2	1	1	2	-	3	2
CO3	3	2			2	-	-	2	2	2	1	1	2	2	3	2
1 - Low					**2 –**Medium					**3 -** High						

COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-A SCHEDULE

DAY : WEDNESDAY(1, 2,3 Hours)
Roll Numbers: 21761A0201 - 21761A0224-----------(24)
Batches :

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	XIV
	Tentative date	15/12	22/12	29/12	5/1	19/1	2/2	9/2	16/2	23/2	2/3	9/3	16/3	23/3	30/3
	Actual date														
B-1	21761A0201 21761A0202 21761A0203	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	21761A0204 21761A0205 21761A0206	DEMO	1	2	3	4	5	6	7	8	9	10			
B-3	21761A0207 21761A0208 21761A0209	DEMO	1	2	3	4	5	6	7	8	9	10			
B-4	21761A0210 21761A0211 21761A0212	DEMO	1	2	3	4	5	6	7	8	9	10			
B-5	21761A0213 21761A0214 21761A0215	DEMO	2	1	4	3	6	5	8	7	10	9			
B-6	21761A0216 21761A0217 21761A0218	DEMO	2	1	4	3	6	5	8	7	10	9			
B-7	21761A0219 21761A0220 21761A0221	DEMO	2	1	4	3	6	5	8	7	10	9			
B-8	21761A0222 21761A0223 21761A0224	DEMO	2	1	4	3	6	5	8	7	10	9			

COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-A SCHEDULE

DAY : THURSDAY(4, 5, 6 Hours)
Roll Numbers: 21761A0225 - 21761A0248-----------(24)
Batches :

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	XIV	XV
	Tentative date	16/12	23/12	30/12	6/1	20/1	27/1	3/2	10/2	17/2	24/2	3/3	10/3	17/3	24/3	31/3
	Actual date															
B-1	21761A0225 21761A0226 21761A0227	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-2	21761A0228 21761A0229 21761A0230	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-3	21761A0231 21761A0232 21761A0233	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-4	21761A0234 21761A0235 21761A0236	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-5	21761A0237 21761A0238 21761A0239	DEMO	DEMO	2	1	4	3	6	5	8	7	10	9			
B-6	21761A0240 21761A0241 21761A0242	DEMO	DEMO	2	1	4	3	6	5	8	7	10	9			
B-7	21761A0243 21761A0244 21761A0245	DEMO	DEMO	2	1	4	3	6	5	8	7	10	9			
B-8	21761A0246 21761A0247 21761A0248	DEMO	DEMO	2	1	4	3	6	5	8	7	10	9			

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.

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.
PSO 4	Design controllers for electrical and electronic systems to improve their performance

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.P.Deepak Reddy MR.Imran Abdul Smt.T.Naga Durga	Mr.P.Deepak Reddy	Dr.A.V.G.A.Marthanda	Dr.J.Sivavara Prasad
Signature				

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr.M.Raja Nayak, Mr. Imran Abdul, Dr. G. Nageswara Rao.
Course Name & Code : Electronic Circuits and Devices Lab & 20EE53
L-T-P Structure : 0-0-3   **Credits:** 1
Program/Sem/Sec : B.Tech., I-Sem., EEE – B section   **A.Y.:** 2021-22

PREREQUISITE: None

COURSE EDUCATIONAL OBJECTIVES (CEOs):

This lab course enables the student to demonstrate characteristics of semiconductor devices.

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

CO1	Analyze the characteristics of semi-conductor devices
CO2	Identify a suitable electronic circuit for a particular application
CO3	Design transistor amplifier circuits

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2			2	-	-	2	2	2	1	1	2	-	3	2
CO2	3	2	-		2	-	-	2	2	2	1	1	2	-	3	2
CO3	3	2			2	-	-	2	2	2	1	1	2	2	3	2
1 - Low					**2 –Medium**					**3 - High**						

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-B SCHEDULE

DAY : TUESDAY(1, 2,3 Hours)
Roll Numbers: 21761A0249 - 21761A0271-----------(23)
Batches :

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	14/12	21/12	28/12	4/1	11/1	18/1	25/1	8/2	15/2	22/2	8/3	15/3	22/3
	Actual date													
B-1	21761A0249 21761A0250 21761A0251	DEMO	1	2	3	4	5	6	7	8	9	10		
B-2	21761A0252 21761A0253 21761A0254	DEMO	2	3	4	5	1	7	8	9	10	6		
B-3	21761A0255 21761A0256 21761A0257	DEMO	3	4	5	1	2	8	9	10	6	7		
B-4	21761A0258 21761A0259 21761A0260	DEMO	4	5	1	2	3	9	10	6	7	8		
B-5	21761A0261 21761A0262 21761A0263	DEMO	5	1	2	3	4	10	6	7	8	9	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-6	21761A0264 21761A0265 21761A0266 21761A0267	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	21761A0268 21761A0269 21761A0270 21761A0271	DEMO	2	3	4	5	1	7	8	9	10	6		

COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-B SCHEDULE

DAY : SATURDAY(4, 5, 6 Hours)
Roll Numbers: 21761A0272 - 21761A0294-----------(23)
Batches :

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	18/25	1/1	8/1	22/1	29/1	12/2	19/2	26/2	5/3	5/3	12/3	19/3	26/3
	Actual date													
B-1	21761A0272 21761A0273 21761A0274	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	21761A0275 21761A0276 21761A0277	DEMO	2	3	4	5	1	7	8	9	10	6		
B-3	21761A0278 21761A0279 21761A0280	DEMO	3	4	5	1	2	8	9	10	6	7		
B-4	21761A0281 21761A0282 21761A0283	DEMO	4	5	1	2	3	9	10	6	7	8		
B-5	21761A0284 21761A0285 21761A0286	DEMO	5	1	2	3	4	10	6	7	8	9		
B-6	21761A0287 21761A0288 21761A0289 21761A0290	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	21761A0291 21761A0292 21761A0293 21761A0294	DEMO	2	3	4	5	1	7	8	9	10	6		

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.

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.**
PSO 4	**Design controllers for electrical and electronic systems to improve their performance**

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.M.Raja Naik MR.Imran Abdul Dr.G.Nageswaa Rao**	**Mr.M.Raja Naik**	**Dr.A.V.G.A.Marthanda**	**Dr.J.Sivavara Prasad**
Signature				

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: S.Uma Maheswara Reddy/M.Oliva
Course Name & Code : Engineering Workshop
L-T-P Structure **: 0-0-3**
Credits **:** 2
Program/Sem/Sec : B.Tech, I-Sem, EEE-A Section
A.Y. **:** 2021-22

PREREQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

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

CO1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
CO2	Fabricate and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
CO3	Produce various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
CO4	Perform various basic House Wiring techniques.

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

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

TEXTBOOKS:
  T1 Workshop Technology by B.S Raghu Vamsi
  T2 Workshop Technology By Hezra Chowadary
REFERENCE BOOKS:
  R1 Lab Manual

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (Batch –B1)

S. No.	Experiment to be conducted	No. of No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	*Demonstration*	3	15-12-2021		TLM8	
16.	*Experiment-1*	3	22-12-2021		TLM8	
17.	Experiment-2	3	29-12-2021		TLM8	
18.	Experiment-3	3	05-01-2022		TLM8	
19.	Experiment-4	3	19-01-2022		TLM8	
20.	Experiment-5	3	02-02-2022		TLM8	
21.	**09.02.2022-MID -I**					
22.	Experiment-6	3	16-02-2022		TLM8	
23.	Experiment-7	3	23-02-2022		TLM8	
24.	Experiment-8	3	02-03-2022		TLM8	
25.	Demonstration of TIN SMITHY	3	09-03-2022		TLM8	
26.	Demonstration of Black SMITHY	3	16-03-2022		TLM8	
27.	Repetition	3	23-03-2022		TLM8	
28.	Lab Internal	3	30-03-2022			

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (Batch –B2)

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.	*Demonstration*	3	16-12-2021		TLM8	
2.	*Experiment-1*	3	23-12-2021		TLM8	
3.	Experiment-2	3	30-12-2021		TLM8	
4.	Experiment-3	3	06-01-2022		TLM8	
5.	Experiment-4	3	20-01-2022		TLM8	
6.	Experiment-5	3	27-01-2022		TLM8	
7.	Experiment-6	3	03-02-2022		TLM8	
8.	10.02.2022-MID -I					
9.	Experiment-7	3	17-02-2022			
10.	Experiment-8	3	24-02-2022		TLM8	
11.	Demonstration of TIN SMITHY	3	03-03-2022		TLM8	
12.	Demonstration of Black SMITHY	3	10-03-2022		TLM8	
13.	Repetition	3	17-03-2022		TLM8	
14.	Repetition	3	24-03-2022		TLM8	
15.	Lab Internal	3	31-03-2022			

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

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	2 W

PART-C

EVALUATION PROCESS:

Evaluation Task	Cos	Marks
Day to Day Evaluation: A	1,2,3,4	A=5
Internal Lab Exams: B	1,2,3,4	B=5
Record: C	1,2,3,4	C=5
Cumulative Internal Examination : CIE=A+B+C	**1,2,3,4**	**CIE=15**
Semester End Examinations: SEE	**1,2,3,4**	**SEE=35**
Total Marks: CIE+SEE	**1,2,3,4**	**50**

Details of Batches:

Batch No.	Reg. No. of Students	Number of Students
B11	**21761A0225-236**	12
B12	**21761A0237-248**	12
B21	**21761A0201-212**	12
B22	**21761A0213-224**	12

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	P1	P2	E1	E2	C1	C2	D1	D2
B21	P1	P2	E1	E2	C1	C2	F1	F2	D1	D2
B22	E1	E2	C1	C2	F1	F2	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-Joint	CO2
4.	Fitting-2 (F2)-V-Joint	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-Joint	CO2
	4.	Fitting-2 (F2)-V-Joint	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

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 analyse 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. S.Uma Maheswara Reddy/ M.Oliva	Mr. Seelam Srinivasa Reddy	Mr.J.Subba Reddy	Dr. Seelam Pichi Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: S.Srinivasa Reddy/ A J S A V Varaprasad
Course Name & Code : Engineering Workshop
L-T-P Structure : **0-0-3**
Credits : 2
Program/Sem/Sec : B.Tech, I-Sem, EEE-B Section
A.Y. : 2021-22

PREREQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

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

CO1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
CO2	Fabricate and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
CO3	Produce various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
CO4	Perform various basic House Wiring techniques.

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

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

TEXTBOOKS:

T1 Workshop Technology by B.S Raghu Vamsi

T2 Workshop Technology By Hezra Chowadary

REFERENCE BOOKS:

R1 Lab Manual

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (Batch –B1)

S. No.	Experiment to be conducted	No. of No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	*Demonstration*	3	14-12-2021		TLM8	
2.	*Experiment-1*	3	21-12-2021		TLM8	
3.	Experiment-2	3	04-01-2021		TLM8	
4.	Experiment-3	3	11-01-2022		TLM8	
5.	Experiment-4	3	18-01-2022		TLM8	
6.	Experiment-5	3	25-01-2022		TLM8	
7.	Repetition	3	01-02-2022		TLM8	
8.	**08.02.2022-MID –I**					
9.	Experiment-6	3	15-02-2022		TLM8	
10.	Experiment-7	3	22-02-2022		TLM8	
11.	Experiment-8	3	01-03-2022		TLM8	
12.	Demonstration of TIN SMITHY	3	08-03-2022		TLM8	
13.	Demonstration of Black SMITHY	3	15-03-2022		TLM8	
14.	Repetition	3	22-03-2022		TLM8	
15.	Lab Internal	3	29-03-2022		TLM8	
16.	**05.04.2022-MID –II**					

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (Batch –B2)

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.	*Demonstration*	3	18-12-2021		TLM8	
2.	*Experiment-1*	3	8-1-2022		TLM8	
3.	Experiment-2	3	22-1-2021		TLM8	
4.	Experiment-3	3	29-01-2022		TLM8	
5.	Experiment-4	3	05-02-2022		TLM8	
6.	Experiment-5	3	12-02-2022		TLM8	
7.	Experiment-6	3	19-02-2022		TLM8	
8.	Experiment-7	3	17-02-2022			
9.	Experiment-8	3	26-02-2022		TLM8	
10.	Demonstration of TIN SMITHY	3	05-03-2022		TLM8	
11.	Demonstration of Black SMITHY	3	19-03-2022		TLM8	
12.	Lab Internal	3	26-03-2022		TLM8	

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

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	2 W

PART-C

EVALUATION PROCESS:

Evaluation Task	Cos	Marks
Day to Day Evaluation: A	1,2,3,4	A=5
Internal Lab Exams: B	1,2,3,4	B=5
Record: C	1,2,3,4	C=5
Cumulative Internal Examination : CIE=A+B+C	**1,2,3,4**	**CIE=15**
Semester End Examinations: SEE	**1,2,3,4**	**SEE=35**
Total Marks: CIE+SEE	**1,2,3,4**	**50**

Details of Batches:

Batch No.	Reg. No. of Students	Number of Students
B11	21761A0249-21761A0260	12
B12	21761A0261-21761A0271	11
B21	21761A0272-21761A0283	12
B22	21761A0284-21761A0294	11

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
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9.	Black Smithy (D1)	CO3
10.	Tin Smithy (D2)	CO3

Cycle	Exp.No.	Name of the Experiment	Related CO
Cycle-1	11.	Carpentry -1 (C1)-Corner Bridle Joint	CO1
	12.	Carpentry -2 (C2)-Dovetail Joint	CO1
	13.	Fitting-1 (F1)-T-Joint	CO2
	14.	Fitting-2 (F2)-V-Joint	CO2
	15.	Plumbing-1 (P1)-Pipe Threading practice	CO3
	16.	Plumbing-2 (P2)-Pipe Layout	CO3
	17.	House Wiring-1 (E1) – Series and Parallel connection	CO4
	18.	House Wiring-2 (E2) – Fluorescent Lamp and Calling bell Circuit	CO4
Cycle-2	19.	Black Smithy (D1)	CO3
	20.	Tin Smithy (D2)	CO3

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Name of the Faculty	Mr. S.Srinivasa Reddy/ A J S A V Varaprasad	Mr. Seelam Srinivasa Reddy	Mr.J.Subba Reddy	Dr. Seelam Pichi Reddy
Signature				