LAKIREDDY 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

Part-A

PROGRAM : B.Tech. I-Sem., ECE (A)

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Professional Communication - I (17FE02)

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : K. Sridevi

COURSE COORDINATOR : Dr.B.Samrajya Lakshmi

PRE-REQUISITES: Students should have basics in English vocabulary and Grammar & they should write error free sentences

Course Educational Objective (CEOs): To Improve vocabulary, Grammar, Verbal – Non verbal Communication; to develop adaptability, assertive skills and Team spirit for skillful management in work place; and to Interpret technical data given in the form of charts, graphs & pictograms for writing technical reports.

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

CO1: Use appropriate vocabulary to interpret data thoroughly and to write reports effectively.
CO2: Face any situation with confidence and voice opinions/decisions assertively.
CO3: Use English Language effectively in spoken and written forms.
CO4: Work effectively in teams for better result.
CO5: Communicate effectively using verbal and non-verbal dimensions aptly.

Course Articulation Matrix:

Course Code	COs	Programme Outcomes												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
17FE02	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 = 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/B/C

UNIT-I :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to UNIT-I	1	20.12.17		TLM1			
2.	Good Manners – J.C.Hill	1	22.12.17		TLM1	CO1	T1	
3.	Idioms	1	23.12.17		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
4.	One-word Substitutes	1	27.12.17		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
5.	Sequence of tenses	1	29.12.17		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
6.	Subject – Verb Agreement (Concord)	1	30.12.18		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
7.	If- Rudyard Kipling	1	03.01.18		TLM1	CO1	T1	
8.	Information Transfer	2	05.01.18 & 06.01.18		TLM1, TLM2	CO1	T1,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
9.	Verger – Somerset Maugham	1	10.01.18		TLM1, TLM6	CO2	T2	
10.	Assertive skills from the story/ personal level/ workplace	1	12.01.18		TLM1, TLM6	CO2	T2,R2,R4	
11.	Expanding proverbs on Assertive skills	1	19.01.18		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
12.	White washing the fence – Mark Twain	1	20.01.18		TLM1, TLM6	CO2	T2	
13.	Teamwork skills from the story/ work place	1	24.01.18		TLM1, TLM6	CO2	T2,R2,R4	
14.	Expanding proverbs on Teamwork	1	27.01.18		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
15.	Note-making	1	31.01.18		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
16.	Abstract/Summary writing	2	02.02.18 & 03.02.18		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
No. of classes required to complete UNIT-II :09					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
17.	Oh Father, Dear Father – Raj Kinger	1	10.02.18		TLM1	CO3	T1	
18.	Foreign Languages and their Influence on English	1	14.02.18		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
19.	Conditional Sentences	1	16.02.18		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
20.	Degrees of	1	17.02.18		TLM1, TLM2,	CO3	T1,R1, R3	

	Comparison				TLM5, TLM6			
21.	Question Tags	1	21.02.18		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
22.	Basic Education – M.K. Gandhi	1	23.02.18		TLM1, TLM6	CO3	T1	
23.	Report Writing	1	24.02.18		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
24.	Sen˜or Payroll – W E Barrett	1	28.02.18		TLM1, TLM6	CO4	T2	
25.	Organizational Communication	1	03.03.18		TLM1, TLM6	CO4	T2,R2,R4	
26.	Adaptability skills from the story	1	07.03.18		TLM1, TLM6	CO4	T2,R2,R4	
27.	Adaptability skills at work place & Real life	1	09.03.18		TLM1, TLM6	CO4	T2,R2,R4	
28.	Expanding proverbs on Adaptability skills	1	10.03.18		TLM1, TLM2, TLM5, TLM6	CO4	T2,R2,R4	
29.	Active & Passive Voice	1	14.03.18		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
30.	Active & Passive Voice	1	16.03.18		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
31.	Direct & Indirect Speech	1	17.03.18		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
No. of classes required to complete UNIT-IV :08					No. of classes taken:			

UNIT-V :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	A real good smile – Bill Naughton	1	21.03.18 & 23.03.18		TLM1, TLM6	CO5	T2	
33.	Non-Verbal Communication Skills from the story	1	24.03.18		TLM1, TLM6	CO5	T2,R2,R4	
34.	Non-Verbal Communication skills through real life experiences	1	28.03.18		TLM1, TLM6	CO5	T2,R2,R4	
35.	articulation and gestures	1	31.03.18		TLM1, TLM2, TLM5, TLM6	CO5	T2,R2,R4	
36.	'Wh' & 'Yes' or 'No' questions	1	04.04.18		TLM1, TLM2, TLM5, TLM6	CO5	T2,R1,R3	
37.	Proverbial expansion on Non-Verbal Communication	1	06.04.18 & 07.04.18		TLM1, TLM2, TLM5, TLM6	CO5	T2,R2,R4	
38.	Common Errors	1	11.04.18 & 13.04.18		TLM1, TLM2, TLM5, TLM6	CO5	T2,R1,R3	
No. of classes required to complete UNIT-V :10					No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
39.	SOP	1	13-04-2018		TLM1, TLM2, TLM5, TLM6		T1,T2	
40.								
41.								

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	Cos	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	3,4,5	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)		D=5
Cumulative Internal Examination : A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

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

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

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

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

PROGRAM OUTCOMES

Engineering Graduates will be able to:

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

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

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

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

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

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

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

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

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

PROGRAM SPECIFIC OUTCOMES

1. Programming Paradigms:

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

2. Data Engineering:

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

3. Software Engineering:

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

Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSE HANDOUT

Part-A

PROGRAM : B.Tech. II-Sem., ECE (B)

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Professional Communication - II (17FE02)

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : Mr. B. Sreenivasa Reddy

COURSE COORDINATOR : Dr. B. Samrajya Lakshmi

PRE-REQUISITES: Students should have basics in English vocabulary and Grammar & they should write error free sentences.

Course Educational Objective (CEOs): To Improve vocabulary, Grammar, Verbal – Non verbal Communication; to develop adaptability, assertive skills and Team spirit for skillful management in work place; and to Interpret technical data given in the form of charts, graphs & pictograms for writing technical reports.

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

CO1: Use appropriate vocabulary to interpret data thoroughly and to write reports effectively.
CO2: Face any situation with confidence and voice opinions/decisions assertively.
CO3: Use English Language effectively in spoken and written forms.
CO4: Work effectively in teams for better result.
CO5: Communicate effectively using verbal and non-verbal dimensions aptly.

Course Articulation Matrix:

Course Code	COs	Programme Outcomes												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
17FE02	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 = 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.
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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/B/C

UNIT-I :

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Introduction to Subject	1	20.12.2017					
43.	Course Outcomes	1	21.12.2017					
44.	Introduction to UNIT-I	1	22.12.2017		TLM1	CO1	T1	
45.	Good Manners – J.C.Hill	1	27.12.2017		TLM1	CO1	T1	
46.	Idioms	1	28.12.2017		TLM1, TLM2, TLM5	CO1	T1	
47.	One-word Substitutes	1	29.12.2017		TLM1, TLM2, TLM5	CO1	T1	
48.	Sequence of tenses	1	03.01.2018		TLM1, TLM2, TLM5	CO1	T1	
49.	Subject – Verb Agreement (Concord)	1	04.01.2018		TLM1, TLM2, TLM5	CO1	T1	
50.	If- Rudyard Kipling	1	05.01.2018		TLM1	CO1	T1	

51.	Information Transfer	1	10.01.2018		TLM1, TLM2,	CO1	T1	
52.	TUTORIAL-1	1	11.01.2018		TLM3	CO1	T1	
No. of classes required to complete UNIT-I					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
53.	Verger – Somerset Maugham	1	12.01.2018		TLM1, TLM6	CO2	T2	
54.	Assertive skills from the story	1	17.01.2018		TLM1, TLM6	CO2	T2	
55.	Assertive skills at personal level/workplace	1	18.01.2018		TLM1, TLM6	CO2	T2	
56.	Expanding proverbs on Assertive skills	1	19.01.2018		TLM1, TLM6	CO2	T2	
57.	White washing the fence – Mark Twain	1	24.01.2018		TLM1, TLM2, TLM5, TLM6	CO2	T2	
58.	Teamwork skills from the story	1	25.01.2018		TLM1, TLM6	CO2	T2	
59.	Teamwork at work place & its Importance	1	31.01.2018		TLM1, TLM6	CO2	T2	
60.	Expanding proverbs on Teamwork	1	01.02.2018		TLM1, TLM6	CO2	T2	
61.	Note making/ Abstract/Summary writing	1	02.02.2018		TLM1, TLM2, TLM5, TLM6	CO2	T2	
62.	TUTORIAL-2	1	02.02.2018		TLM3	CO2		
No. of classes required to complete UNIT-II					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
63.	Oh Father, Dear Father – Raj Kinger	1	14.02.2018		TLM1	CO3	T1	
64.	Foreign Languages and their Influence on English	1	15.02.2018		TLM1, TLM2, TLM5, TLM6	CO3	T1	
65.	Conditional Sentences	1	16.02.2018		TLM1, TLM2, TLM5, TLM6	CO3	T1	
66.	Degrees of Comparison	1	21.02.2018		TLM1, TLM2, TLM5, TLM6	CO3	T1	
67.	Question Tags	1	22.02.2018		TLM1, TLM2, TLM5, TLM6	CO3	T1	
68.	Basic Education – M.K. Gandhi	1	23.02.2018		TLM1, TLM6	CO3	T1	
69.	Report Writing	1	28.02.2018		TLM1, TLM2, TLM5, TLM6	CO3	T1	
70.	TUTORIAL-3	1	01.03.2018		TLM3	CO3	T1	
No. of classes required to complete UNIT-III					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
71.	Sen˜or Payroll – W E Barrett	1	07.03.2018		TLM1, TLM6	CO4	T2	
72.	Organizational Communication	1	08.03.2018		TLM1, TLM6	CO4	T2	
73.	Adaptability skills from the story	1	09.03.2018		TLM1, TLM6	CO4	T2	
74.	Adaptability skills at work place & Real life	1	14.03.2018		TLM1, TLM6	CO4	T2	
75.	Expanding proverbs on Adaptability skills	1	15.03.2018		TLM1, TLM2, TLM5, TLM6	CO4	T2	
76.	Active & Passive Voice	1	16.03.2018		TLM1, TLM2, TLM5, TLM6	CO4	T2	

77.	Direct & Indirect Speech	1	21.03.2018		TLM1, TLM2, TLM5, TLM6	CO4	T2	
78.	TUTORIAL-4		22.03.2018		TLM3	CO4	T2	
No. of classes required to complete UNIT-IV					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
79.	A real good smile – Bill Naughton	1	23.03.2018		TLM1, TLM6	CO5	T2	
80.	Non-Verbal Communication Skills from the story	1	28.03.2018		TLM1, TLM6	CO5	T2	
81.	Non-Verbal Communication skills through real life experiences	1	29.03.2018		TLM1, TLM6	CO5	T2	
82.	articulation and gestures	1	04.04.2018		TLM1, TLM2, TLM5, TLM6	CO5	T2	
83.	'Wh' & 'Yes' or 'No' questions	1	06.04.2018		TLM1, TLM2, TLM5, TLM6	CO5	T2	
84.	Proverbial expansion on Non-Verbal Communication	1	11.04.2018		TLM1, TLM2, TLM5, TLM6	CO5	T2	
85.	Common Errors	1	12.04.2018		TLM1, TLM2, TLM5, TLM6	CO5	T2	
86.	TUTORIAL-5	1	13.04.2018		TLM3	CO5	T2	
No. of classes required to complete UNIT-V					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
87.								
88.								
89.								

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	**COs**	**Marks**
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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
Cumulative Internal Examination : A+B	**1,2,3,4,5**	**A+B=25**
Semester End Examinations	**1,2,3,4,5**	**C=75**
Total Marks: A+B+C	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PROGRAMME OUTCOMES (POs)

PSOs

Mr. B. Sreenivasareddy	Dr. B. Samrajya Lakshmi	Dr. B. Samrajya Lakshmi	Dr. A. Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech. I-Sem., ECE (C)

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Professional Communication - I (17FE02)

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : Dr.B.Samrajya Lakshmi

COURSE COORDINATOR : Dr.B.Samrajya Lakshmi

PRE-REQUISITES: Students should have basics in English vocabulary and Grammar & they should write error free sentences

Course Educational Objective (CEOs): To Improve vocabulary, Grammar, Verbal – Non verbal Communication; to develop adaptability, assertive skills and Team spirit for skillful management in work place; and to Interpret technical data given in the form of charts, graphs & pictograms for writing technical reports.

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

CO1: Use appropriate vocabulary to interpret data thoroughly and to write reports effectively.
CO2: Face any situation with confidence and voice opinions/decisions assertively.
CO3: Use English Language effectively in spoken and written forms.
CO4: Work effectively in teams for better result.
CO5: Communicate effectively using verbal and non-verbal dimensions aptly.

Course Articulation Matrix:

Course Code	COs	Programme Outcomes												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
17FE02	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 = 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/B/C

UNIT-I :

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
90.	Introduction to UNIT-I	1	18-12-2017		TLM1			
91.	Good Manners – J.C.Hill	1	19-12-2017		TLM1	CO1	T1	
92.	Idioms	1	22-12-2017		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
93.	One-word Substitutes	1	26-12-2017		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
94.	Sequence of tenses	1	29-12-2017		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
95.	Subject – Verb Agreement (Concord)	1	02-01-2018		TLM1, TLM2, TLM5	CO1	T1,R1,R3	
96.	If- Rudyard Kipling	1	05-01-2018		TLM1	CO1	T1	
97.	Information Transfer	1	08-01-2018		TLM1, TLM2	CO1	T1,R2,R4	
No. of classes required to complete UNIT-I					No. of classes taken: 08			

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
98.	Verger – Somerset Maugham	1	09-01-2018		TLM1, TLM6	CO2	T2	
99.	Assertive skills from the story/ personal level/ workplace	1	12-01-2018		TLM1, TLM6	CO2	T2,R2,R4	
100.	Expanding proverbs on Assertive skills	1	19-01-2018		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
101.	White washing the fence – Mark Twain	1	22-01-2018		TLM1, TLM6	CO2	T2	
102.	Teamwork skills from the story/ work place	1	23-01-2018		TLM1, TLM6	CO2	T2,R2,R4	
103.	Expanding proverbs on Teamwork	1	29-01-2018		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
104.	Note-making	1	30-01-2018		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
105.	Abstract/Summary writing	1	02-02-2018		TLM1, TLM2, TLM5, TLM6	CO2	T2,R2,R4	
No. of classes required to complete UNIT-II					No. of classes taken: 8			

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
106	Oh Father, Dear Father – Raj Kinger	1	10-02-2018		TLM1	CO3	T1	
107	Foreign Languages and their Influence on English	1	12-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
108	Conditional Sentences	1	16-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	

109	Degrees of Comparison	1	19-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
110	Question Tags	1	20-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R1, R3	
111	Basic Education – M.K. Gandhi	1	23-02-2018		TLM1, TLM6	CO3	T1	
112	Report Writing	1	26-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
113	Report Writing	1	27-02-2018		TLM1, TLM2, TLM5, TLM6	CO3	T1,R2, R4	
No. of classes required to complete UNIT-III					No. of classes taken: 8			

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
114.	Sen˜or Payroll – W E Barrett	1	05-03-2018		TLM1, TLM6	CO4	T2	
115.	Organizational Communication	1	06-03-2018		TLM1, TLM6	CO4	T2,R2,R4	
116.	Adaptability skills from the story	1	09-03-2018		TLM1, TLM6	CO4	T2,R2,R4	
117.	Adaptability skills at work place & Real life	1	12-03-2018		TLM1, TLM6	CO4	T2,R2,R4	
118.	Expanding proverbs on Adaptability skills	1	13-03-2018		TLM1, TLM2, TLM5, TLM6	CO4	T2,R2,R4	
119.	Active & Passive Voice	1	16-03-2018		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
120.	Active & Passive Voice	1	19-03-2018		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
121.	Direct & Indirect Speech	1	20-03-2018		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
122.	Direct & Indirect Speech	1	23-03-2018		TLM1, TLM2, TLM5, TLM6	CO4	T2,R1,R3	
No. of classes required to complete UNIT-IV					No. of classes taken: 9			

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
123.	A real good smile – Bill Naughton	1	26-03-2018		TLM1, TLM6	CO5	T2	
124.	Non-Verbal Communication Skills from the story	1	27-03-2018		TLM1, TLM6	CO5	T2,R2,R4	
125.	Non-Verbal Communication skills through real life experiences	1	02-04-2018		TLM1, TLM6	CO5	T2,R2,R4	
126.	articulation and gestures	1	03-04-2018		TLM1, TLM2, TLM5, TLM6	CO5	T2,R2,R4	
127.	'Wh' & 'Yes' or 'No' questions	1	06-04-2018		TLM1, TLM2, TLM5, TLM6	CO5	T2,R1,R3	
128.	Proverbial expansion on Non-Verbal Communication	1	09-04-2018		TLM1, TLM2, TLM5, TLM6	CO5	T2,R2,R4	
129.	Common Errors	1	10-04-2018		TLM1, TLM2, TLM5, TLM6	CO5	T2,R1,R3	
130.	Common Errors	1	12-04-2018		TLM1, TLM2, TLM5, TLM6	CO5	T2,R1,R3	
No. of classes required to complete UNIT-V					No. of classes taken:8			

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
131.	SOP	1	13-04-2018		TLM1, TLM2, TLM5, TLM6		T1,T2	

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	Cos	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	3,4,5	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)		D=5
Cumulative Internal Examination : A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

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

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

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

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

PROGRAM OUTCOMES

Engineering Graduates will be able to:

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

14. **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.

15. **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.

16. **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.

17. **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.

18. **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.

19. **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.

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

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

22. **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.

23. **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.

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

PROGRAM SPECIFIC OUTCOMES

1. Programming Paradigms:

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

2. Data Engineering:

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

3. Software Engineering:

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

Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS & 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

Part-A

PROGRAM : B.Tech., II-Sem., ECE A SEC

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Transformation Techniques and Vector Calculus – 17FE06

L-T-P STRUCTURE : 4-1-0

COURSE CREDITS : 4

COURSE INSTRUCTOR : Dr.A.Rami Reddy

COURSE COORDINATOR : Y.P.C.S. Anil Kumar

PRE-REQUISITES: Integration and Vectors

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students are introduced to Integral transformations which include Laplace Transforms and Z – Transforms. They will also learn Multiple Integrals in different coordinate systems and Vector Calculus.

COURSE OUTCOMES (COs)

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

CO1: Apply the concepts of Laplace Transforms to solve ordinary differential equations.

CO2: Apply Z - Transforms to solve difference equations

CO3: Discriminate among Cartesian, Polar and Spherical coordinates in multiple integrals and their respective applications to areas and volumes.

CO4: Evaluate the directional derivative, divergence and angular velocity of a vector function.

CO5: Apply Vector Integration for curves, surfaces and volumes and relationship among themselves.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		1								1
CO2	3	2		1								1
CO3	3	2		1								1
CO4	3	2		1								1
CO5	3	2		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 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

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

BOS APPROVED REFERENCE BOOKS:

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

R2 Erwin Krezig, "Advanced Engineering Mathematics", 8thEdition, John Wiley & Sons, New Delhi, 2011.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Laplace Transforms and Inverse Laplace Transforms

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	1	19/12/17		TLM1			
2.	Course Outcomes	1	20/12/17		TLM1			
3.	Introduction to UNIT-I	1	21/12/17		TLM1	CO1	T1,T2	
4.	Laplace Transforms of standard functions	1	22/12/17		TLM1	CO1	T1,T2	
5.	Linear Property, Shifting Theorems, Change of Scale Property	1	23/12/17		TLM1	CO1	T1,T2	
6.	Multiplication by 't'	1	26/12/17		TLM1	CO1	T1,T2	
7.	Division by 't'	1	27/12/17		TLM1	CO1	T1,T2	
8.	Unit Step function, Transforms of derivatives	1	28/12/17		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	29/12/17		TLM3	CO1	T1,T2	
10.	Transformation of integrals	1	30/12/17		TLM1	CO1	T1,T2	
11.	Dirac's Delta function.	1	02/01/18		TLM1	CO1	T1,T2	
12.	Inverse Laplace Transforms, Linear Property, Shifting Properties	1	03/01/18		TLM1	CO1	T1,T2	
13.	Convolution theorem	1	04/01/18		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	05/01/18		TLM3	CO1	T1,T2	
15.	Application of L.T. to ordinary differential equation	1	06/01/18		TLM1	CO1	T1,T2	
16.	Application of L.T. to ordinary	1	09/01/18		TLM1	CO1	T1,T2	

	differential equation							
17.	Assignment/Quiz	1	10/01/18		TLM6	CO1	T1,T2	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II: Z-Transforms

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.	Introduction to UNIT II	1	11/01/18		TLM1	CO2	T1,T2	
19.	Z-transform	1	12/01/18		TLM1	CO2	T1,T2	
20.	Properties	1	18/01/18		TLM1	CO2	T1,T2	
21.	TUTORIAL - 3	1	19/01/18		TLM3	CO2	T1,T2	
22.	Damping rule	1	20/01/18		TLM1	CO2	T1,T2	
23.	Shifting rule	1	23/01/18		TLM1	CO2	T1,T2	
24.	Initial and final value theorems	1	24/01/18		TLM1	CO2	T1,T2	
25.	Inverse Z-transform	1	25/01/18		TLM1	CO2	T1,T2	
26.	Convolution theorem	1	27/01/18		TLM1	CO2	T1,T2	
27.	Convolution theorem	1	30/01/18		TLM1	CO2	T1,T2	
28.	Solution of difference equation by Z-transform	1	31/01/18		TLM1	CO2	T1,T2	
29.	Solution of difference equation by Z-transform	1	01/02/18		TLM1	CO2	T1,T2	
30.	TUTORIAL - 4	1	02/02/18		TLM3	CO2	T1,T2	
31.	Assignment/Quiz	1	03/02/18		TLM6	CO2	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

UNIT-III: Multiple Integrals

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
32.	Introduction to UNIT III	1	14/02/18		TLM1	CO3	T1,T2	
33.	Multiple Integrals	1	15/02/18		TLM1	CO3	T1,T2	
34.	Change of variables	1	16/02/18		TLM1	CO3	T1,T2	
35.	Double Integrals - Cartesian coordinates	1	17/02/18		TLM1	CO3	T1,T2	

36.	Double Integrals-Polar co ordinates	1	20/02/18		TLM1	CO3	T1,T2	
37.	Double Integrals-Spherical co ordinates	1	21/02/18		TLM1	CO3	T1,T2	
38.	Triple Integrals - Cartesian coordinates	1	22/02/18		TLM1	CO3	T1,T2	
39.	TUTORIAL - 5	1	23/02/18		TLM3	CO3	T1,T2	
40.	Triple Integrals - Polar coordinates	1	24/02/18		TLM1	CO3	T1,T2	
41.	Triple Integrals - Spherical coordinates	1	27/02/18		TLM1	CO3	T1,T2	
42.	Change of order of Integration	1	28/02/18		TLM1	CO3	T1,T2	
43.	Change of order of Integration	1	01/03/18		TLM1	CO3	T1,T2	
44.	TUTORIAL - 6	1	02/03/18		TLM3	CO3	T1,T2	
45.	Applications to Areas	1	03/03/18		TLM1	CO3	T1,T2	
46.	Applications to Volumes	1	06/03/18		TLM1	CO3	T1,T2	
47.	Assignment/Quiz	1	07/03/18		TLM6	CO3	T1,T2	
No. of classes required to complete UNIT-III		16			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
48.	Introduction to UNIT IV	1	08/03/18		TLM1	CO4	T1,T2	
49.	Vector Differentiation, Gradient	1	09/03/18		TLM1	CO4	T1,T2	
50.	Directional Derivative	1	13/03/18		TLM1	CO4	T1,T2	
51.	Divergence	1	14/03/18		TLM1	CO4	T1,T2	
52.	Curl	1	15/03/18		TLM1	CO4	T1,T2	
53.	TUTORIAL - 7	1	16/03/18		TLM3	CO4	T1,T2	
54.	Solenoidal fields, Irrotational fields, potential surfaces	1	17/03/18		TLM1	CO4	T1,T2	
55.	Laplacian, second order operators	1	20/03/18		TLM1	CO4	T1,T2	
56.	Properties	1	21/03/18		TLM1	CO4	T1,T2	
57.	Properties	1	22/03/18		TLM1	CO4	T1,T2	

58.	TUTORIAL - 8	1	23/03/18		TLM3	CO4	T1,T2	
59.	Assignment/Quiz	1	24/03/18		TLM6	CO4	T1,T2	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V: Vector Integration

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
60.	Introduction to UNIT V	1	27/03/18		TLM1	CO5	T1,T2	
61.	Line Integral	1	28/03/18		TLM1	CO5	T1,T2	
62.	Work done and area	1	29/03/18		TLM1	CO5	T1,T2	
63.	TUTORIAL - 9	1	30/03/18		TLM3	CO5	T1,T2	
64.	Surface Integrals	1	31/03/18		TLM1	CO5	T1,T2	
65.	Volume Integrals	1	03/04/18		TLM1	CO5	T1,T2	
66.	Greens theorem	1	04/04/18		TLM1	CO5	T1,T2	
67.	Related problems	1	05/04/18		TLM1	CO5	T1,T2	
68.	TUTORIAL - 10	1	06/04/18		TLM3	CO5	T1,T2	
69.	Stokes theorem	1	07/04/18		TLM1	CO5	T1,T2	
70.	Related problems	1	10/04/18		TLM1	CO5	T1,T2	
71.	Gauss Divergence theorem	1	11/04/18		TLM1	CO5	T1,T2	
72.	Assignment/Quiz	1	12/04/18		TLM6	CO5	T1,T2	
No. of classes required to complete UNIT-V		13			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
73.	Further applications in Multiple Integrals		13/04/18		TLM1		T1,T2	

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

Part - C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment	1	A1=5
Assignment	2	A2=5
I-Mid Examination	1,2	B1=20
Quiz	1,2	D1=10
Assignment	3	A3=5
Assignment	4	A4=5
Assignment	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz	3,4,5	D2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Mid Marks: D=75% of Max(D1,D2)+25% of Min(D1,D2)	1,2,3,4,5	D=10
Attendence: E		E=5
Cumulative Internal Examination : A+B+D+E	**1,2,3,4,5**	**40**
Semester End Examinations: C	**1,2,3,4,5**	**60**
Total Marks: A+B+D+E+C	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)
PROGRAMME OUTCOMES (POs)
PSOs

Dr.A.Rami Reddy	Y.P.C.S.Anil kumar	Dr.A.Rami Reddy	Dr.A.Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem., ECE B SEC

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Transformation Techniques and Vector Calculus – 17FE06

L-T-P STRUCTURE : 4-1-0

COURSE CREDITS : 4

COURSE INSTRUCTOR : K.N.V.Lakshmi

COURSE COORDINATOR : Y.P.C.S. Anil Kumar

PRE-REQUISITES: Integration and Vectors

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students are introduced to Integral transformations which include Laplace Transforms and Z – Transforms. They will also learn Multiple Integrals in different coordinate systems and Vector Calculus.

COURSE OUTCOMES (COs)

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

CO1: Apply the concepts of Laplace Transforms to solve ordinary differential equations.

CO2: Apply Z - Transforms to solve difference equations

CO3: Discriminate among Cartesian, Polar and Spherical coordinates in multiple integrals and their respective applications to areas and volumes.

CO4: Evaluate the directional derivative, divergence and angular velocity of a vector function.

CO5: Apply Vector Integration for curves, surfaces and volumes and relationship among themselves.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		1								1
CO2	3	2		1								1
CO3	3	2		1								1
CO4	3	2		1								1
CO5	3	2		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 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

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

BOS APPROVED REFERENCE BOOKS:

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

R2 Erwin Krezig, "Advanced Engineering Mathematics", 8thEdition, John Wiley & Sons, New Delhi, 2011.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Laplace Transforms and Inverse Laplace Transforms

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	1	19/12/17		TLM1			
2.	Course Outcomes	1	20/12/17		TLM1			
3.	Introduction to UNIT-I	1	21/12/17		TLM1	CO1	T1,T2	
4.	Laplace Transforms of standard functions	1	22/12/17		TLM1	CO1	T1,T2	
5.	Linear Property, Shifting Theorems, Change of Scale Property	1	23/12/17		TLM1	CO1	T1,T2	
6.	Multiplication by 't'	1	26/12/17		TLM1	CO1	T1,T2	
7.	Division by 't'	1	27/12/17		TLM1	CO1	T1,T2	
8.	Unit Step function, Transforms of derivatives	1	28/12/17		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	29/12/17		TLM3	CO1	T1,T2	
10.	Transformation of integrals	1	30/12/17		TLM1	CO1	T1,T2	
11.	Dirac's Delta function.	1	02/01/18		TLM1	CO1	T1,T2	
12.	Inverse Laplace Transforms, Linear Property, Shifting Properties	1	03/01/18		TLM1	CO1	T1,T2	
13.	Convolution theorem	1	04/01/18		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	05/01/18		TLM3	CO1	T1,T2	
15.	Application of L.T. to ordinary differential equation	1	06/01/18		TLM1	CO1	T1,T2	
16.	Application of L.T. to ordinary	1	09/01/18		TLM1	CO1	T1,T2	

	differential equation							
17.	Assignment/Quiz	1	10/01/18		TLM6	CO1	T1,T2	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II: Z-Transforms

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.	Introduction to UNIT II	1	11/01/18		TLM1	CO2	T1,T2	
19.	Z-transform	1	12/01/18		TLM1	CO2	T1,T2	
20.	Properties	1	18/01/18		TLM1	CO2	T1,T2	
21.	TUTORIAL - 3	1	19/01/18		TLM3	CO2	T1,T2	
22.	Damping rule	1	20/01/18		TLM1	CO2	T1,T2	
23.	Shifting rule	1	23/01/18		TLM1	CO2	T1,T2	
24.	Initial and final value theorems	1	24/01/18		TLM1	CO2	T1,T2	
25.	Inverse Z-transform	1	25/01/18		TLM1	CO2	T1,T2	
26.	Convolution theorem	1	27/01/18		TLM1	CO2	T1,T2	
27.	Convolution theorem	1	30/01/18		TLM1	CO2	T1,T2	
28.	Solution of difference equation by Z-transform	1	31/01/18		TLM1	CO2	T1,T2	
29.	Solution of difference equation by Z-transform	1	01/02/18		TLM1	CO2	T1,T2	
30.	TUTORIAL - 4	1	02/02/18		TLM3	CO2	T1,T2	
31.	Assignment/Quiz	1	03/02/18		TLM6	CO2	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

UNIT-III: Multiple Integrals

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
32.	Introduction to UNIT III	1	14/02/18		TLM1	CO3	T1,T2	
33.	Multiple Integrals	1	15/02/18		TLM1	CO3	T1,T2	
34.	Change of variables	1	16/02/18		TLM1	CO3	T1,T2	
35.	Double Integrals - Cartesian coordinates	1	17/02/18		TLM1	CO3	T1,T2	

36.	Double Integrals-Polar co ordinates	1	20/02/18		TLM1	CO3	T1,T2	
37.	Double Integrals-Spherical co ordinates	1	21/02/18		TLM1	CO3	T1,T2	
38.	Triple Integrals - Cartesian coordinates	1	22/02/18		TLM1	CO3	T1,T2	
39.	TUTORIAL - 5	1	23/02/18		TLM3	CO3	T1,T2	
40.	Triple Integrals - Polar coordinates	1	24/02/18		TLM1	CO3	T1,T2	
41.	Triple Integrals - Spherical coordinates	1	27/02/18		TLM1	CO3	T1,T2	
42.	Change of order of Integration	1	28/02/18		TLM1	CO3	T1,T2	
43.	Change of order of Integration	1	01/03/18		TLM1	CO3	T1,T2	
44.	TUTORIAL - 6	1	02/03/18		TLM3	CO3	T1,T2	
45.	Applications to Areas	1	03/03/18		TLM1	CO3	T1,T2	
46.	Applications to Volumes	1	06/03/18		TLM1	CO3	T1,T2	
47.	Assignment/Quiz	1	07/03/18		TLM6	CO3	T1,T2	
No. of classes required to complete UNIT-III		16			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
48.	Introduction to UNIT IV	1	08/03/18		TLM1	CO4	T1,T2	
49.	Vector Differentiation, Gradient	1	09/03/18		TLM1	CO4	T1,T2	
50.	Directional Derivative	1	13/03/18		TLM1	CO4	T1,T2	
51.	Divergence	1	14/03/18		TLM1	CO4	T1,T2	
52.	Curl	1	15/03/18		TLM1	CO4	T1,T2	
53.	TUTORIAL - 7	1	16/03/18		TLM3	CO4	T1,T2	
54.	Solenoidal fields, Irrotational fields, potential surfaces	1	17/03/18		TLM1	CO4	T1,T2	
55.	Laplacian, second order operators	1	20/03/18		TLM1	CO4	T1,T2	
56.	Properties	1	21/03/18		TLM1	CO4	T1,T2	
57.	Properties	1	22/03/18		TLM1	CO4	T1,T2	

58.	TUTORIAL - 8	1	23/03/18		TLM3	CO4	T1,T2	
59.	Assignment/Quiz	1	24/03/18		TLM6	CO4	T1,T2	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V: Vector Integration

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
60.	Introduction to UNIT V	1	27/03/18		TLM1	CO5	T1,T2	
61.	Line Integral	1	28/03/18		TLM1	CO5	T1,T2	
62.	Work done and area	1	29/03/18		TLM1	CO5	T1,T2	
63.	TUTORIAL - 9	1	30/03/18		TLM3	CO5	T1,T2	
64.	Surface Integrals	1	31/03/18		TLM1	CO5	T1,T2	
65.	Volume Integrals	1	03/04/18		TLM1	CO5	T1,T2	
66.	Greens theorem	1	04/04/18		TLM1	CO5	T1,T2	
67.	Related problems	1	05/04/18		TLM1	CO5	T1,T2	
68.	TUTORIAL - 10	1	06/04/18		TLM3	CO5	T1,T2	
69.	Stokes theorem	1	07/04/18		TLM1	CO5	T1,T2	
70.	Related problems	1	10/04/18		TLM1	CO5	T1,T2	
71.	Gauss Divergence theorem	1	11/04/18		TLM1	CO5	T1,T2	
72.	Assignment/Quiz	1	12/04/18		TLM6	CO5	T1,T2	
No. of classes required to complete UNIT-V		13			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
73.	Further applications in Multiple Integrals		13/04/18		TLM1		T1,T2	

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

Part - C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment	1	A1=5
Assignment	2	A2=5
I-Mid Examination	1,2	B1=20
Quiz	1,2	D1=10
Assignment	3	A3=5
Assignment	4	A4=5
Assignment	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz	3,4,5	D2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Mid Marks: D=75% of Max(D1,D2)+25% of Min(D1,D2)	1,2,3,4,5	D=10
Attendence: E		E=5
Cumulative Internal Examination : A+B+D+E	**1,2,3,4,5**	**40**
Semester End Examinations: C	**1,2,3,4,5**	**60**
Total Marks: A+B+D+E+C	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)
PROGRAMME OUTCOMES (POs)
PSOs

K.N.V.Lakshmi	Y.P.C.S.Anil kumar	Dr.A.Rami Reddy	Dr.A.Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem., ECE-C

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : TRANSFORMATION TECHNIQUES & VECTOR CALCULUS & 17FE06

L-T-P STRUCTURE : 4-1-0

COURSE CREDITS : 3

COURSE INSTRUCTOR : **CH.CHAITANYA**

COURSE COORDINATOR : **Mr. Y.P.C.S ANIL KUMAR**

PRE-REQUISITES: Fundamental knowledge of Differentiation and Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs) :

This course provides the knowledge of

- The basic concepts of Laplace Transforms
- The concepts of Inverse Laplace Transforms and their applications to differential equations.
- Z-transform and its role in discrete analysis and in solving Difference equations.
- The concepts of multiple integrals and changing of order of integration
- The concepts of Vector Calculus, Vector Differentiation and Conservative Fields.
- The concepts of line integrals, surface and volume integrals , vector integral theorems and their applications

COURSE OUTCOMES (COs)

Upon The Successful Completion of This Course Students Will be Able To:

CO1: Apply the concept of Laplace Transforms to solve a differential equation of any order using Laplace Transforms.

CO2: Understand the analogy between Laplace Transform and Z-Transform and apply it wherever necessary

CO3: Learn Multiple Integrals in various coordinate systems

CO4: Understand the Vector, Solenoidal and Conservative Fields and will be to apply it in necessary areas.

CO5: Apply Vector Integration for curves, surfaces and volumes and relationship among themselves.

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

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

Text Books:

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

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

References:

R1: Michael D. Greenberg , "*Advanced Engineering Mathematics*", 2nd Edition, TMH, New Delhi, 2011.
R2 : Erwin Krezig, "*Advanced Engineering Mathematics*", 8th Edition, John Wiley & Sons, New Delhi, 2011.

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
74.	Introduction to Subject & Course Outcomes	1	18-12-2017		**TLM1**	CO1	T1, T2	
75.	Laplace transforms of standard functions	1	19-12-2017		TLM1	CO1	T1, T2	
76.	Linear Property	1	20-12-2017		**TLM1**	CO1	T1, T2	
77.	Shifting Theorems	1	22-12-2017		**TLM1**	CO1	T1, T2	
78.	TUTORIAL-2	1	23-12-2017		**TLM3**	CO1	T1, T2	
79.	Change of Scale Property	1	26-12-2017		**TLM1**	CO1	T1, T2	
80.	Multiplication by t	1	27-12-2017		**TLM1**	CO1	T1, T2	
81.	Division by 't'	1	29-12-2017		**TLM1**	CO1	T1, T2	
82.	Transforms of derivatives and integrals	1	30-12-2017		**TLM1**	CO1	T1, T2	
83.	Unit step function –Dirac's delta function.	1	02-01-2018		**TLM1**	CO1	T1, T2	
84.	Inverse Laplace transforms– Linear Property	1	03-01-2018		**TLM1**	CO1	T1, T2	
85.	TUTORIAL-2	1	05-01-2018		**TLM3**	CO1	T1, T2	
86.	Shifting Properties	1	06-01-2018		**TLM1**	CO1	T1, T2	
87.	Multiplication and division by 's'	1	08-01-2018		**TLM1**	CO1	T1, T2	
88.	Convolution theorem	1	09-01-2018		**TLM1**	CO1	T1, T2	
89.	Applications of Laplace transforms to ordinary differential equations.	1	10-01-2018		**TLM1**	CO1	T1, T2	

90.	TUTORIAL-2	1	16-01-2018		**TLM3**	CO1	T1, T2	
No. of classes required to complete UNIT-I		17			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
91.	**Introduction**	1	17-01-2018		**TLM1**	CO2	T1, T2	
92.	Z-transform properties	1	19-01-2018		**TLM1**	CO2	T1, T2	
93.	Damping rule	1	20-01-2018		**TLM1**	CO2	T1, T2	
94.	Shifting rule	1	22-01-2018		**TLM1**	CO2	T1, T2	
95.	TUTORIAL-2	1	23-01-2018		**TLM3**	CO2	T1, T2	
96.	Initial and final value theorems	1	24-01-2018		**TLM1**	CO2	T1, T2	
97.	Inverse Z –transform	1	27-01-2018		**TLM1**	CO2	T1, T2	
98.	Partial fraction method	1	29-01-2018		**TLM1**	CO2	T1, T2	
99.	Convolution theorem	1	30-01-2018		**TLM1**	CO2	T1, T2	
100.	Convolution theorem	1	31-01-2018		**TLM1**	CO2	T1, T2	
101.	Solution of difference equation by Z-transforms	1	01-02-2018		**TLM1**	CO2	T1,T2	
102.	Solution of difference equation by Z-transforms	1	02-02-2018		**TLM1**	CO2	T1, T2	
103.	TUTORIAL-2		03-02-2018		**TLM3**	CO2	T1, T2	
No. of classes required to complete UNIT-II		13			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
10	Introduction	1	10-02-2018		**TLM1**	CO3	T1, T2	
10	Multiple integrals	1	12-02-2018		**TLM1**	CO3	T1, T2	
10	double and triple integrals (Cartesian)	1	13-02-2018		**TLM1**	CO3	T1, T2	
10	TUTORIAL-2	1	16-02-2018		**TLM3**	CO3	T1, T2	
10	double integrals (Cartesian)	1	17-02-2018		**TLM1**	CO3	T1, T2	
10	double integrals (Cartesian)	1	19-12-2018		**TLM1**	CO3	T1, T2	
11	triple integrals (Cartesian)	1	20-02-2018		**TLM1**	CO3	T1, T2	

11	double integrals -polar	1	21-02-2018		**TLM1**	CO3	T1, T2	
11	double integrals polar	1	23-02-2018		**TLM1**	CO3	T1, T2	
11	triple integrals -spherical	1	24-02-2018		**TLM1**	CO3	T1, T2	
11	TUTORIAL-2	1	26-02-2018		**TLM3**	CO3	T1, T2	
11	Changing of order of Integration	1	27-02-2018		**TLM1**	CO3	T1, T2	
11	Changing of order of Integration	1	28-02-2018		**TLM1**	CO3	T1, T2	
11	Applications to areas and volumes.	1	01-03-2018		**TLM1**	CO3	T1, T2	
11	TUTORIAL-2	1	03-03-2018		**TLM3**	CO3	T1, T2	
No. of classes required to complete UNIT-III		15				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
119.	Introduction on Vector Differentiation	1	05-03-2018		**TLM1**	CO4	T1, T2	
120.	Gradient	1	06-03-2018		**TLM1**	CO4	T1, T2	
121.	Directional Derivatives	1	07-03-2018		**TLM1**	CO4	T1, T2	
122.	Directional Derivatives	1	09-03-2018		**TLM1**	CO4	T1, T2	
123.	Divergence	1	10-03-2018		**TLM1**	CO4	T1, T2	
124.	Solenoidal field	1	12-03-2018		**TLM1**	CO4	T1, T2	
125.	TUTORIAL-2	1	13-03-2018		**TLM3**	CO4	T1, T2	
126.	Curl	1	14-03-2018		**TLM1**	CO4	T1, T2	
127.	Curl problems	1	16-03-2018		**TLM1**	CO4	T1, T2	
128.	Irrotational fields	1	17-03-2018		**TLM1**	CO4	T1, T2	
129.	Potential surfaces	1	19-03-2018		**TLM1**	CO4	T1, T2	
130.	Laplacian and second order operators	1	20-03-2018		TLM1	CO4	T1, T2	
131.	Properties of sums and products	1	21-03-2018		**TLM1**	CO4	T1, T2	
132.	TUTORIAL-8	1	23-03-2018		**TLM3**	CO4	T1, T2	
No. of classes required to complete UNIT-IV		14			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

133.	Vector Integration	1	24-03-2018		**TLM1**	CO5	T1, T2	
134.	Line integral	1	27-03-2018		**TLM1**	CO5	T1, T2	
135.	work done –area	1	31-03-2018		**TLM1**	CO5	T1, T2	
136.	TUTORIAL-2	1	02-04-2018		TLM3	CO5	T1, T2	
137.	surface integrals	1	03-04-2018		TLM1	CO5	T1, T2	
138.	volume integrals	1	04-04-2018		TLM1	CO5	T1, T2	
139.	Greens Theorem	1	06-04-2018		**TLM1**	CO5	T1, T2	
140.	Stokes Theorem	1	07-04-2018		**TLM1**	CO5	T1, T2	
141.	Stokes Theorem	1	09-04-2018		**TLM1**	CO5	T1, T2	
142.	Gauss Divergence Theorem	1	10-04-2018		**TLM1**	CO5	T1, T2	
143.	Gauss Divergence Theorem	1	11-04-2018		**TLM1**	CO5	T1, T2	
144.	TUTORIAL-2	1	12-04-2018		**TLM3**	CO5	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
145.	Applications of Laplace trans forms in signal processing	1	13-04-2018		TLM1		T1, T2

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	**COs**	**Marks**
I-Mid Examination (Descriptive) =**A**	1,2	A=20
II-Mid Examination (Descriptive) =**B**	3,4,5	B=20
Evaluation of Mid Marks: **A+B** =75% of Max(A,B)+25% of Min(A,B)	1,2,3,4,5	A+B=20
Evaluation of quiz = **C**	1,2,3,4,5	C=10
Evaluation of assignments	1,2,3,4,5	D= 5
ATTENDANCE		E= 5
Cumulative Internal Examination : A+B+C+D+E	**1,2,3,4,5**	**A+B+C+D+E=4**
Semester End Examinations =D	**1,2,3,4,5**	**D=60**
Total Marks: A+B+C+D	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.

PEO 2: Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.

PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.

PEO 4: Able to understand the professional code of ethics and demonstrate ethical behavior, effective communication, team work and leadership skills in their job.

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 solution sin 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.

CH.CHAITANYA	Y.P.C.S. ANIL KUMAR	Dr. A. RAMI REDDY	Dr. A. RAMI REDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,
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L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem., ECE-A

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : APPLIED PHYSICS & 17FE12

L-T-P STRUCTURE : 3-2-0

COURSE CREDITS : 4

COURSE INSTRUCTOR : **N.ARUNA**

COURSE COORDINATOR : **Dr T VASANTHA RAO**

Pre-requisites : Basics in Light, Conductivity in different solid materials etc.,

Course Educational Objectives : To make students learn the basic concepts of Optics such as Interference, Diffraction, Polarization and Lasers; the principle of quantum mechanics, free electron theory of metals, Concept of semi conductors, diodes and different types of polarizations in dielectrics and their applications.

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

Co1: Define the nature of Interference and Diffraction.
Co2: Describe the polarization and LASER, types of lasers and their applications.
Co3: Estimate the electrical conductivity in metals.
Co4: Design the circuits of semiconductor diodes, LED, Photodiode, Solar cell.
Co5: Classify the different types of polarizations in dielectric materials.

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

APPLIED PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**2**								**3**
CO2.	**3**	**3**	**3**	**2**								**3**
CO3.	**3**	**3**	**2**	**2**								**3**
CO4.	**3**	**3**	**2**	**2**								**3**
CO5.	**3**	**3**	**2**	**2**								**3**
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:

Text Books:

TEXT BOOKS

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2013.

T2 : D. K.Bhattacharya, Poonam Tandon, " Applied *Physics*", Oxford press, New Delhi, 1st Edition, 2016.

REFERENCES

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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): Section- A

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject, Course Outcomes	1	18-12-2017		**TLM2**	CO1	T1 or T2	
2.	Introduction to UNIT-I	1	19-12-2017		**TLM1**	CO1	T1 or T2	
3.	Superposition of waves,	1	20-12-2017		**TLM1**	CO1	T1 or T2	
4.	Coherence, Conditions for Interference	1	22-12-2017		**TLM1**	CO1	T1 or T2	
5.	Interference from thin films	1	23-12-2017		**TLM1**	CO1	T1 or T2	
6.	Newton's rings	1	26-12-2017		**TLM1 TLM2**	CO1	T1 or T2	
7.	Michelson's interferometer	1	27-12-2017		**TLM1 TLM2**	CO1	T1 or T2	
8.	Tutorial 1	1	29-12-2017		**TLM3**	CO1	T1 or T2	
9.	Introduction – Diffraction	1	30-12-2017		**TLM1**	CO1	T1 or T2	
10.	Single slit diffraction	1	02-01-2018		**TLM1 TLM2**	CO1	T1 or T2	
11.	Double slit diffraction	1	03-01-2018		**TLM1**	CO1	T1 or T2	
12.	Diffraction –Circular aperture	1	05-01-2018		**TLM1 TLM2**	CO1	T1 or T2	
13.	Diffraction –N parallel	1	06-01-		**TLM1**	CO1	T1 or T2	

	slits, Diffraction grating,		2018		**TLM2**			
14.	Resolving power of grating,	1	08-01-2018		**TLM1**	CO1	T1 or T2	
15.	Resolving power of Telescope	1	09-01-2018		**TLM1**	CO1	T1 or T2	
16.	TUTORIAL-2	1	10-01-2018		**TLM3**	CO1	T1 or T2	
17.	Assignment/Quiz	1	12-01-2018			CO1	T1 or T2	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Polarisation and Lasers

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.	**UNIT II :introduction** polarization of light, Brewster's law	1	17-01-2018		**TLM1 TLM2**	CO2	T1 or T2	
19.	Double refraction, Geometry of calcite crystal	1	19-01-2018		**TLM1 TLM2**	CO2	T1 or T2	
20.	Nicol Prism, QWP& HWP	1	20-01-2018		**TLM1**	CO2	T1 or T2	
21.	Optical Activity, polarimeter	1	22-01-2018		**TLM1**	CO2	T1 or T2	
22.	TUTORIAL-3	1	23-01-2018		**TLM3**	CO2	T1 or T2	
23.	Introduction - characteristics of Lasers	1	24-01-2018		**TLM1 TLM2**	CO2	T1 or T2	
24.	Principle of Laser, Einstein's coefficients	1	27-01-2018		**TLM1**	CO2	T1 or T2	
25.	Population inversion,	1	29-01-2018		**TLM1**	CO2	T1 or T2	
26.	Pumping mechanism,	1	30-01-2018		**TLM1**	CO2	T1 or T2	
27.	Nd-YAG Laser	1	31-01-2018		**TLM1, TLM2**	CO2	T1 or T2	
28.	He-Ne gas laser	1	02-02-2018		**TLM1, TLM2**	CO2	T1 or T2	
29.	TUTORIAL-4	1	03-02-2018		**TLM3**	CO2	T1 or T2	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III : Principles of Quantum Mechanics and Free electron theory

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	**I MID**	1	05-02-2018			Co1,Co2		
31	**I MID**	1	06-02-2018			Co1,Co2		
32	**I MID**	1	07-02-2018			Co1,Co2		
33	**I MID**	1	08-02-2018			Co1,Co2	T1 or T2	
34	Introduction to principles of quantum mechanics	1	10-02-2018		**TLM1**	CO3	T1 or T2	
35	De Broglie hypothesis	1	12-02-2018		**TLM1**	CO3	T1 or T2	
36	Experimental verification Davisson and Germer Experiment	1	14-02-2018		**TLM1 TLM2**	CO3	T1 or T2	
37	Schrodinger wave equation	1	16-02-2018		**TLM1**	CO3	T1 or T2	
38	Physical significance of wave function	1	17-02-2018		**TLM1**	CO3	T1 or T2	
39	Particle in a box	1	19-02-2018		**TLM1 TLM2**	CO3	T1 or T2	
40	TUTORIAL-5	1	20-02-2018		**TLM3**	CO3	T1 or T2	
41	Classical free electron theory-postulates	1	21-02-2018		**TLM1**	CO3	T1 or T2	
42	Expression for electrical conductivity and drift velocity	1	23-02-2018		**TLM1**	CO3	T1 or T2	
43	Advantageous and drawbacks	1	24-02-2018		**TLM1**	CO3	T1 or T2	
44	Fermi –Dirac statistics	1	26-02-2018		**TLM1**	CO3	T1 or T2	
45	Classification of band theory of Solids	1	27-02-2018		**TLM1 TLM2**	CO3	T1 or T2	
46	Tutorial - 6	1	28-02-2018		**TLM3**	CO3	T1 or T2	
47	Assignment / Quiz - 3	1	02-03-2018		**TLM1**	CO3	T1 or T2	
No. of classes required to complete UNIT-III		14				No. of classes taken:		

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
48.	Classification of semiconductors		03-03-2018		**TLM1**	CO4	T1 or T2	
49.	Carrier concentration in an intrinsic semiconductor	1	05-03-2018		**TLM1**	CO4	T1 or T2	
50.	Concentration and Fermi levels in an intrinsic semiconductor	1	06-03-2018		**TLM1**	C04	T1 or T2	
51.	Conductivity of semiconductors	1	07-03-2018		**TLM1**	CO4	T1 or T2	
52.	Drift and diffusion, Einstein relation	1	09-03-2018		**TLM1**	CO4	T1 or T2	
53.	TUTORIAL-7	1	12-03-2018		**TLM3**	CO4	T1 or T2	
54.	Hall Effect	1	13-03-2018		**TLM1 TLM2**	CO4	T1 or T2	
55.	Direct band gap and indirect band gap semiconductors - differences	1	14-03-2018		**TLM1 TLM2**	CO4	T1 or T2	
56.	LED	1	16-03-2018		**TLM1**	CO4	T1 or T2	
57.	Photo Detectors	1	17-03-2018		**TLM1**	CO4	T1 or T2	
58.	Solar cell, Application of Solar cell	1	19-03-2018		**TLM1 TLM2**	CO4	T1 or T2	
59.	TUTORIAL-8	1	20-03-2018		**TLM3**	CO4	T1 or T2	
60.	Assignment / Quiz - 4	1	21-03-2018		**TLM1**	CO4	T1 or T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V : Dielectric Materials

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
61.	**Introduction,** Dielectric parameters		23-03-2018		**TLM1**	CO5	T1 or R2	
62.	Electronic Polarization		24-03-2018		**TLM1**	CO5	T1 or R2	
63.	Ionic polarization		26-03-2018		**TLM1**	CO5	T1 or R2	
64.	Orientation and space charge polarization	1	27-03-2018		**TLM1**	CO5	T1 or R2	
65.	Local field and classius mosotti equation	1	28-03-2018		**TLM1**	CO5	T1 or R2	

66.	TUTORIAL-9	1	31-03-2018		**TLM3 TLM2**	CO5	T1 or R2	
67.	Dielectric loss	1	02-04-2018		**TLM1**	CO5	T1 or R2	
68.	Dielectric breakdown	1	03-04-2018		TLM1	CO5	T1 or R2	
69.	Ferro electricity and Piezo electricity	1	04-04-2018		TLM1 **TLM2**	CO5	T1 or R2	
70.	Applications of dielectric materials	1	06-04-2018		TLM1 **TLM2**	CO5	T1 or R2	
71.	TUTORIAL-10	1	07-04-2018		**TLM3**	CO5	T1 or R2	
72.	Assignment / Quiz - 5	1	09-04-2018			CO5	T1 or R2	
73.	Revision	1	10-04-2018		**TLM1**	CO5	T1 or R2	
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
1.	Nano materials preparation		11-04-2018		**TLM1 TLM2**	CO5	T1 or T2	
2.	applications		13-04-2018		**TLM1 TLM2**	CO5	T1 or T2	
3.	II MID EXAM		16-04-2018			CO3,CO4,CO5		
4.	II MID EXAM		17-04-2018			CO3,CO4,CO5		
5.	II MID EXAM		19-04-2018			CO3,CO4,CO5		
6.	II MID EXAM		20-04-2018			CO3,CO4,CO5		

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	**COs**	**Marks**
I-Mid Examination (Descriptive) =**A**	1,2	A=20
II-Mid Examination (Descriptive) =**B**	3,4,5	B=20
Evaluation of Mid Marks: **A+B** =75% of Max(A,B)+25% of Min(A,B)	1,2,3,4,5	A+B = 20
I- QUIZ Examination(ONLINE) = **C**	1,2	C =10
II- QUIZ Examination (ONLINE) =**D**	3,4,5	D =10
Evaluation of QUIZ Marks: **C+D** =75% of Max(C,D)+25% of Min(C,D)	1,2,3,4,5	C+D = 10
Evaluation of assignments /quiz =**E**	1,2,3,4,5	E = 5
Evaluation of attendance Marks = **F**	1,2,3,4,5	F = 5
Cumulative Internal Examination : (A + B) + (C + D) + E + F = 40	**1,2,3,4,5**	**40**
Semester End Examinations = G	**1,2,3,4,5**	**G = 60**
Total Marks: (A + B) + (C + D) + E + F + G =	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.

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PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.

PEO 4: Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, team work and leadership skills in their job.

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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.
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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 solution sin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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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 Information Technology will have the ability to

1.Organize, Analyze and Interpret the data to extract meaningful conclusions.

2.Design, Implement and Evaluate a computer-based system to meet desired needs.

3. Develop IT application services with the help of different current engineering tools.

N.ARUNA	Dr T. VASANTHA RAO	Dr T. VASANTHA RAO	Dr A. RAMIREDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : APPLIED PHYSICS & 17FE12

L-T-P STRUCTURE : 4-1-0

COURSE CREDITS : 4

COURSE INSTRUCTOR : **Dr T VASANTHA RAO**

COURSE COORDINATOR : **Dr T VASANTHA RAO**

Pre-requisites : Basics in Light, Conductivity in different solid materials etc.,

Course Educational Objectives : To make students learn the basic concepts of Optics such as Interference, Diffraction, Polarization and Lasers; the principle of quantum mechanics, free electron theory of metals, Concept of semi conductors, diodes and different types of polarizations in dielectrics and their applications.

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

Co1: Define the nature of Interference and Diffraction.
Co2: Describe the polarization and LASER, types of lasers and their applications.
Co3: Estimate the electrical conductivity in metals.
Co4: Design the circuits of semiconductor diodes, LED, Photodiode, Solar cell.
Co5: Classify the different types of polarizations in dielectric materials.

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

APPLIED PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO6.	**3**	**3**	**2**	**2**								**3**
CO7.	**3**	**3**	**3**	**2**								**3**
CO8.	**3**	**3**	**2**	**2**								**3**
CO9.	**3**	**3**	**2**	**2**								**3**
CO10.	**3**	**3**	**2**	**2**								**3**
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:

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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): Section- B

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
146.	Introduction to Subject, Course Outcomes	1	18-12-2017		**TLM2**	CO1	T1 or T2	
147.	Introduction to UNIT-I	1	19-12-2017		**TLM1**	CO1	T1 or T2	
148.	Superposition of waves,	1	20-12-2017		**TLM1**	CO1	T1 or T2	
149.	Coherence, Conditions for Interference	1	21-12-2017		**TLM1**	CO1	T1 or T2	
150.	Interference from thin films	1	23-12-2017		**TLM1**	CO1	T1 or T2	
151.	Newton's rings	1	26-12-2017		**TLM1**	CO1	T1 or T2	
152.	Michelson's interferometer	1	27-12-2017		**TLM1**	CO1	T1 or T2	
153.	Tutorial 1	1	28-12-2017		**TLM3**	CO1	T1 or T2	
154.	Introduction – Diffraction	1	30-12-2017		**TLM1**	CO1	T1 or T2	
155.	Single slit diffraction	1	02-01-2018		**TLM1**	CO1	T1 or T2	
156.	Double slit diffraction	1	03-01-2018		**TLM1**	CO1	T1 or T2	
157.	Diffraction –Circular aperture	1	04-01-2018		**TLM1**	CO1	T1 or T2	
158.	Diffraction –N parallel slits, Diffraction grating,	1	06-01-2018		**TLM1**	CO1	T1 or T2	

159.	Resolving power of grating,	1	08-01-2018		**TLM1**	CO1	T1 or T2	
160.	Resolving power of Telescope	1	09-01-2018		**TLM1**	CO1	T1 or T2	
161.	TUTORIAL-2	1	10-01-2018		**TLM3**	CO1	T1 or T2	
162.	Assignment/Quiz	1	11-01-2018			CO1	T1 or T2	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Polarisation and Lasers

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
163.	**UNIT II :introduction** polarization of light, Brewster's law	1	17-01-2018		**TLM1**	CO2	T1 or T2	
164.	Double refraction, Geometry of calcite crystal	1	18-01-2018		**TLM1**	CO2	T1 or T2	
165.	Nicol Prism, QWP& HWP	1	20-01-2018		**TLM1**	CO2	T1 or T2	
166.	Optical Activity, polarimeter	1	22-01-2018		**TLM1**	CO2	T1 or T2	
167.	TUTORIAL-3	1	23-01-2018		**TLM3**	CO2	T1 or T2	
168.	Introduction - characteristics of Lasers	1	24-01-2018		**TLM1**	CO2	T1 or T2	
169.	Principle of Laser, Einstein's coefficients	1	25-01-2018		**TLM1**	CO2	T1 or T2	
170.	Population inversion,	1	27-01-2018		**TLM1**	CO2	T1 or T2	
171.	Pumping mechanism,	1	29-01-2018		**TLM1**	CO2	T1 or T2	
172.	Nd-YAG Laser	1	30-01-2018		**TLM1**	CO2	T1 or T2	
173.	He-Ne gas laser	1	31-01-2018		**TLM1**	CO2	T1 or T2	
174.	TUTORIAL-4	1	01-02-2018		**TLM3**	CO2	T1 or T2	
175.	Assignment / Quiz	1	03-02-2018					
No. of classes required to complete UNIT-II		13			No. of classes taken:			

UNIT-III : Principles of quantum mechanics and free electron theory

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
17	**I MID**	1	05-02-2018			Co1,Co2		
17	**I MID**	1	06-02-2018			Co1,Co2		
17	**I MID**	1	07-02-2018			Co1,Co2		

17	**I MID**	1	08-02-2018			Co1,Co2		
18	Introduction to principles of quantum mechanics	1	10-02-2018		**TLM1**	CO3	T1 or T2	
18	De Broglie hypothesis	1	12-02-2018		**TLM1**	CO3	T1 or T2	
18	Experimental verification Davisson and Germer Experiment	1	14-02-2018		**TLM1**	CO3	T1 or T2	
18	Schrodinger wave equation	1	15-02-2018		**TLM1**	CO3	T1 or T2	
18	Physical significance of wave function	1	17-02-2018		**TLM1**	CO3	T1 or T2	
18	Particle in a box	1	19-02-2018		**TLM1**	CO3	T1 or T2	
18	TUTORIAL-5	1	20-02-2018		**TLM3**	CO3	T1 or T2	
18	Classical free electron theory-postulates	1	21-02-2018		**TLM1**	CO3	T1 or T2	
18	Expression for electrical conductivity and drift velocity	1	22-02-2018		**TLM1**	CO3	T1 or T2	
18	Advantageous and drawbacks	1	24-02-2018		**TLM1**	CO3	T1 or T2	
19	Fermi –Dirac statistics	1	26-02-2018		**TLM1**	CO3	T1 or T2	
19	Classification of band theory of Solids	1	27-02-2018		**TLM1**	CO3	T1 or T2	
19	Tutorial - 6	1	28-02-2018		**TLM3**	CO3	T1 or T2	
19	Assignment / Quiz - 3	1	01-03-2018		**TLM1**	CO3	T1 or T2	
No. of classes required to complete UNIT-III		14				No. of classes taken:		

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
194.	Classification of semiconductors		03-03-2018		**TLM1**	CO4	T1 or T2	
195.	Carrier concentration in an intrinsic semiconductor	1	05-03-2018		**TLM1**	CO4	T1 or T2	
196.	Concentration and Fermi levels in an intrinsic semiconductor	1	06-03-2018		**TLM1**	C04	T1 or T2	
197.	Conductivity of semiconductors	1	07-03-2018		**TLM1**	CO4	T1 or T2	
198.	Drift and diffusion,	1	08-03-2018		**TLM1**	CO4	T1 or T2	

	Einstein relation							
199.	TUTORIAL-7	1	12-03-2018		**TLM3**	CO4	T1 or T2	
200.	Hall Effect	1	13-03-2018		**TLM1**	CO4	T1 or T2	
201.	Direct band gap and indirect band gap semiconductors - differences	1	14-03-2018		**TLM1**	CO4	T1 or T2	
202.	LED	1	15-03-2018		**TLM1**	CO4	T1 or T2	
203.	Photo Detectors	1	17-03-2018		**TLM1**	CO4	T1 or T2	
204.	Solar cell, Application of Solar cell	1	19-03-2018		**TLM1**	CO4	T1 or T2	
205.	TUTORIAL-8	1	20-03-2018		**TLM3**	CO4	T1 or T2	
206.	Assignment / Quiz - 4	1	21-03-2018		**TLM1**	CO4	T1 or T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V : Dielectric materials

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
207.	**Introduction,** Dielectric parameters		22-03-2018		**TLM1**	CO5	T1 or R2	
208.	Electronic Polarization		24-03-2018		**TLM1**	CO5	T1 or R2	
209.	Ionic polarization		26-03-2018		**TLM1**	CO5	T1 or R2	
210.	Orientation and space charge polarization	1	27-03-2018		**TLM1**	CO5	T1 or R2	
211.	Local field and classius mosotti equation	1	28-03-2018		**TLM1**	CO5	T1 or R2	
212.	TUTORIAL-9	1	29-03-2018		**TLM3**	CO5	T1 or R2	
213.	Dielectric loss	1	31-03-2018		**TLM1**	CO5	T1 or R2	
214.	Dielectric breakdown	1	02-04-2018		TLM1	CO5	T1 or R2	
215.	Ferro electricity and Piezo electricity	1	03-04-2018		TLM1	CO5	T1 or R2	
216.	Applications of dielectric materials	1	04-04-2018		TLM1	CO5	T1 or R2	
217.	TUTORIAL-10	1	07-04-2018		**TLM3**	CO5	T1 or R2	
218.	Assignment / Quiz - 5	1	09-04-2018			CO5	T1 or R2	
219.	Revision	1	10-04-2018		**TLM1**	CO5	T1 or R2	
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
7.	Nano materials preparation		11-04-2018		**TLM2**	CO5	T1 or T2	
8.	applications		12-04-2018		**TLM2**	CO5	T1 or T2	

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	COs	Marks
I-Mid Examination (Descriptive) =**A**	1,2	A=20
II-Mid Examination (Descriptive) =**B**	3,4,5	B=20
Evaluation of Mid Marks: **A+B** =75% of Max(A,B)+25% of Min(A,B)	1,2,3,4,5	A+B = 20
I- QUIZ Examination(ONLINE) = **C**	1,2	C =10
II- QUIZ Examination (ONLINE) =**D**	3,4,5	D =10
Evaluation of QUIZ Marks: **C+D** =75% of Max(C,D)+25% of Min(C,D)	1,2,3,4,5	C+D = 10
Evaluation of assignments /quiz =**E**	1,2,3,4,5	E = 5
Evaluation of attendance Marks = **F**	1,2,3,4,5	F = 5
Cumulative Internal Examination : (A + B) + (C + D) + E + F = 40	**1,2,3,4,5**	**40**
Semester End Examinations = G	**1,2,3,4,5**	**G = 60**
Total Marks: (A + B) + (C + D) + E + F + G =	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.

PEO 2: Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.

PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.

PEO 4: Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, team work and leadership skills in their job.

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the Information Technology will have the ability to
1.Organize, Analyze and Interpret the data to extract meaningful conclusions.
2.Design, Implement and Evaluate a computer-based system to meet desired needs.
3. Develop IT application services with the help of different current engineering tools.

Dr T. VASANTHA RAO	Dr T. VASANTHA RAO	Dr T. VASANTHA RAO	Dr A. RAMIREDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY 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

Part-A

PROGRAM : B.Tech., II-Sem., ECE-C

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : APPLIED PHYSICS & 17FE12

L-T-P STRUCTURE : 4-1-0

COURSE CREDITS : 4

COURSE INSTRUCTOR : **Dr. S. YUSUF**

COURSE COORDINATOR : **Dr. T. VASANTHA RAO**

Pre-requisites : Basics in Light, Conductivity in different solid materials etc.,

Course Educational Objectives : To make students learn the basic concepts of Optics such as Interference, Diffraction, Polarization and Lasers; the principle of quantum mechanics, free electron theory of metals, Concept of semi conductors, diodes and different types of polarizations in dielectrics and their applications.

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

Co1: Define the nature of Interference and Diffraction.
Co2: Describe the polarization and LASER, types of lasers and their applications.
Co3: Estimate the electrical conductivity in metals.
Co4: Design the circuits of semiconductor diodes, LED, Photodiode, Solar cell.
Co5: Classify the different types of polarizations in dielectric materials.

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

APPLIED PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO11.	**3**	**3**	**2**	**2**								**3**
CO12.	**3**	**3**	**3**	**2**								**3**
CO13.	**3**	**3**	**2**	**2**								**3**
CO14.	**3**	**3**	**2**	**2**								**3**
CO15.	**3**	**3**	**2**	**2**								**3**
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:

Text Books:

TEXT BOOKS

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2013.

T2 : D. K.Bhattacharya, Poonam Tandon, " Applied *Physics*", Oxford press, New Delhi, 1st Edition, 2016.

REFERENCES

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): Section- B

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
220.	Introduction to Subject, Course Outcomes	1	19-12-2017		**TLM2**	CO1	T1 or T2	
221.	Introduction to UNIT-I	1	20-12-2017		**TLM1**	CO1	T1 or T2	
222.	Superposition of waves,	1	21-12-2017		**TLM1**	CO1	T1 or T2	
223.	Coherence, Conditions for Interference	1	22-12-2017		**TLM1**	CO1	T1 or T2	
224.	Interference from thin films	1	23-12-2017		**TLM1**	CO1	T1 or T2	
225.	Newton's rings	1	26-12-2017		**TLM1**	CO1	T1 or T2	
226.	Michelson's interferometer	1	27-12-2017		**TLM1**	CO1	T1 or T2	
227.	Introduction – Diffraction	1	28-12-2017		**TLM1**	CO1	T1 or T2	
228.	Tutorial -1	1	29-12-2017		TLM3			
229.	Single slit diffraction	1	30-12-2018		**TLM1**	CO1	T1 or T2	
230.	Double slit diffraction	1	02-01-2018		**TLM1**	CO1	T1 or T2	
231.	Diffraction –Circular aperture	1	03-01-2018		**TLM1**	CO1	T1 or T2	
232.	Diffraction –N parallel slits, Diffraction grating,	1	04-01-2018		**TLM1**	CO1	T1 or T2	
233.	TUTORIAL-2	1	05-01-2018		TLM3			

234.	Resolving power of grating,	1	06-01-2018		**TLM1**	CO1	T1 or T2	
235.	Resolving power of Telescope	1	09-01-2018		**TLM1**	CO1	T1 or T2	
236.	Assignment/Quiz	1	10-01-2018		TLM6			
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Polarisation and Lasers

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
237.	**UNIT II :introduction** polarization of light, Brewster's law	1	11-01-2018		**TLM1**	CO2	T1 or T2	
238.	Double refraction, Geometry of calcite crystal	1	18-01-2018		**TLM1**	CO2	T1 or T2	
239.	TUTORIAL-3	1	19-01-2018		TLM3			
240.	3Nicol Prism, QWP& HWP	1	20-01-2018		**TLM1**	CO2	T1 or T2	
241.	Optical Activity, polarimeter	1	23-01-2018		**TLM3**	CO2	T1 or T2	
242.	Introduction - characteristics of Lasers	1	24-01-2018		**TLM1**	CO2	T1 or T2	
243.	Principle of Laser, Einstein's coefficients	1	25-01-2018		**TLM1**	CO2	T1 or T2	
244.	Population inversion,	1	27-01-2018		**TLM1**	CO2	T1 or T2	
245.	Pumping mechanism,	1	30-01-2018		**TLM1**	CO2	T1 or T2	
246.	Nd-YAG Laser	1	31-01-2018		**TLM1**	CO2	T1 or T2	
247.	He-Ne gas laser	1	01-02-2018		**TLM1**	CO2	T1 or T2	
248.	TUTORIAL-4	1	02-02-2018		TLM3			
249.	Assignment / Quiz	1	03-02-2018		**TLM6**			
No. of classes required to complete UNIT-II		13			No. of classes taken:			

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

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	**I MID**	1	05-02-2018			Co1,Co2		
25	**I MID**	1	06-02-2018			Co1,Co2		
25	**I MID**	1	07-02-2018			Co1,Co2		
25	**I MID**	1	08-02-2018			Co1,Co2	T1 or T2	

25	Introduction to principles of quantum mechanics	1	09-02-2018		**TLM1**	CO3	T1 or T2	
25	De Broglie hypothesis	1	14-02-2018		**TLM1**	CO3	T1 or T2	
25	Experimental verification Davisson and Germer Experiment	1	15-02-2018		**TLM1**	CO3	T1 or T2	
25	TUTORIAL- 5	1	16-02-2018		TLM3			
25	Schrodinger wave equation	1	17-02-2018		**TLM1**	CO3	T1 or T2	
25	Physical significance of wave function	1	20-02-2018		**TLM1**	CO3	T1 or T2	
26	Particle in a box	1	21-02-2018		**TLM3**	CO3	T1 or T2	
26	Classical free electron theory-postulates	1	22-02-2018		**TLM1**	CO3	T1 or T2	
26	Tutorial – 6	1	23-02-2018		TLM3			
26	Expression for electrical conductivity and drift velocity	1	24-02-2018		**TLM1**	CO3	T1 or T2	
26	Advantageous and drawbacks	1	27-02-2018		**TLM1**	CO3	T1 or T2	
26	Fermi –Dirac statistics	1	28-02-2018		**TLM1**	CO3	T1 or T2	
26	Classification of band theory of Solids	1	01-03-2018		**TLM1**	CO3	T1 or T2	
26	Assignment / Quiz - 3	1	02-03-2018		**TLM1**	CO3	T1 or T2	
No. of classes required to complete UNIT-III		14				No. of classes taken:		

UNIT-IV : SEMI CONDUCTOR PHYSICS

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
268.	Classification of semiconductors		03-03-2018		**TLM1**	CO4	T1 or T2	
269.	Carrier concentration in an intrinsic semiconductor	1	06-03-2018		**TLM1**	CO4	T1 or T2	
270.	Concentration and Fermi levels in an intrinsic semiconductor	1	07-03-2018		**TLM1**	C04	T1 or T2	
271.	Conductivity of semiconductors	1	08-03-2018		**TLM1**	CO4	T1 or T2	
272.	TUTORIAL-7	1	09-03-2018		**TLM3**			
273.	Drift and diffusion, Einstein relation	1	13-03-2018		**TLM1**	CO4	T1 or T2	

274.	Hall Effect	1	14-03-2018		**TLM1**	CO4	T1 or T2	
275.	Direct band gap and indirect band gap semiconductors - differences	1	15-03-2018		**TLM1**	CO4	T1 or T2	
276.	TUTORIAL-8	1	16-03-2018		**TLM3**			
277.	LED	1	17-03-2018		**TLM1**	CO4	T1 or T2	
278.	Photo Detectors	1	20-03-2018		**TLM1**	CO4	T1 or T2	
279.	Solar cell, Application of Solar cell	1	21-03-2018		**TLM1**	CO4	T1 or T2	
280.	Assignment / Quiz - 4	1	22-03-2018		**TLM1**	CO4	T1 or T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V : DIELECTRIC MATERIALS

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
281.	TUTORIAL-9	1	23-03-2018		**TLM3**			
282.	**Introduction,** Dielectric parameters	1	24-03-2018		**TLM1**	CO5	T1 or R2	
283.	Electronic Polarization	1	27-03-2018		**TLM1**	CO5	T1 or R2	
284.	Ionic polarization	1	28-03-2018		**TLM1**	CO5	T1 or R2	
285.	Orientation and space charge polarization	1	29-03-2018		**TLM1**	CO5	T1 or R2	
286.	Local field and classius mosotti equation	1	31-03-2018		**TLM1**	CO5	T1 or R2	
287.	Dielectric loss	1	03-04-2018		**TLM1**	CO5	T1 or R2	
288.	Dielectric breakdown	1	04-04-2018		TLM1	CO5	T1 or R2	
289.	Ferro electricity and Piezo electricity	1	05-04-2018		TLM1	CO5	T1 or R2	
290.	TUTORIAL-10	1	06-04-2018		TLM3			
291.	Applications of dielectric materials	1	07-04-2018		**TLM1**	CO5	T1 or R2	
292.	Assignment / Quiz - 5	1	09-04-2018		TLM1	CO5	T1 or R2	
293.	Revision	1	10-04-2018		**TLM1**	CO5	T1 or R2	
294.	Revision	1	11-04-2018					
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
9.	Nano materials preparation	1	12-04-2018		**TLM1**	CO5	T1 or T2	
10.	applications	1	13-04-2018		**TLM1**	CO5	T1 or T2	
11.	II MID EXAM		16-04-2018			CO3,CO4,CO5		
12.	II MID EXAM		17-04-2018			CO3,CO4,CO5		
13.	II MID EXAM		18-04-2018			CO3,CO4,CO5		
14.	II MID EXAM		19-04-2018			CO3,CO4,CO5		
15.	II MID EXAM		20-04-2018			CO3,CO4,CO5		

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	COs	Marks
I-Mid Examination (Descriptive) =**A**	1,2	A=20
II-Mid Examination (Descriptive) =**B**	3,4,5	B=20
Evaluation of Mid Marks: **A+B** =75% of Max(A,B)+25% of Min(A,B)	1,2,3,4,5	A+B = 20
I- QUIZ Examination(ONLINE) = **C**	1,2	C =10
II- QUIZ Examination (ONLINE) =**D**	3,4,5	D =10
Evaluation of QUIZ Marks: **C+D** =75% of Max(C,D)+25% of Min(C,D)	1,2,3,4,5	C+D = 10
Evaluation of assignments /quiz =**E**	1,2,3,4,5	E = 5
Evaluation of attendance Marks = **F**	1,2,3,4,5	F = 5
Cumulative Internal Examination : (A + B) + (C + D) + E + F = 40	**1,2,3,4,5**	**40**
Semester End Examinations = G	**1,2,3,4,5**	**G = 60**
Total Marks: (A + B) + (C + D) + E + F + G =	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.

PEO 2: Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.

PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.

PEO 4: Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, team work and leadership skills in their job.

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the Information Technology will have the ability to
1.Organize, Analyze and Interpret the data to extract meaningful conclusions.
2.Design, Implement and Evaluate a computer-based system to meet desired needs.
3. Develop IT application services with the help of different current engineering tools.

Dr. S. YUSUF	Dr T. VASANTHA RAO	Dr T. VASANTHA RAO	Dr A. RAMIREDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM : B.Tech. II-Sem.,Sec-A, ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Analog Electronic Circuits – 17EC03

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : Mr.M.Samba Siva Reddy

COURSE COORDINATOR : Mr. B Y V N R Swamy

PRE-REQUISITE: Electronic Devices and Circuits

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course gives the ability to analyze and design analog electronic circuits using discrete components. To empower the students to understand the design, working and analysis of BJT / FET amplifiers using appropriate equivalent models. And it gives the importance and effect of feedback in amplifiers to improve stability and to design oscillators.

COURSE OUTCOMES (CO)

CO1: Design different single stage and multistage amplifiers.
CO2: Understand the effect of capacitances on frequency response.
CO3: Understand the applications of power and tuned amplifiers.
CO4: Know the importance of negative feedback in amplifiers.
CO5: Design Sinusoidal oscillators for different frequencies.

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	2	-
CO2	3	-	2	-	-	-	-	-	-	-	-	-	3	2	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	2	-	2	2	-	-	-	-	-	-	-	-	-	1	-
CO5	3	-	1	-	-	-	-	-	-	-	-	-	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 Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, Publishers, New Delhi, Fourth reprint 2011.

T2 Donald A.Neamen, "Electronic Circuit Analysis and Design",Tata McGraw Hill Publishers, 2nd Edition.

BOS APPROVED REFERENCE BOOKS:

R1 P.John Paul, "Electronic Devices and Circuits", New Age International Publishers.

R2 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson education Publishers, 10th Edition.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I : SMALL SIGNAL LOW FREQUENCY AMPLIFIERS & FET 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
1.	Introduction to Subject, Course Outcomes	1	18-12-17		**TLM1**		T1, R2	
2.	Introduction to UNIT-I	1	20-12-17		**TLM1**	CO1	T1, R2	
3.	Hybrid parameter model of a Two Port Network	1	21-12-17		**TLM1**	CO1	T1, R2	
4.	h parameter model for Transistor configurations and Typical h parameter values and h parameter conversion	1	22-12-17		**TLM1**	CO1	T1, R2	
5.	Analysis of CE Amplifier	1	23-12-17		**TLM1**	CO1	T1, R2	
6.	Analysis of CB and CC Amplifier	1	27-12-17		**TLM1**	CO1	T1, R2	
7.	Approximate analysis of CE amplifier with and without bypass capacitor	1	28-12-17		**TLM1**	CO1	T1, R2	
8.	Approximate analysis of CB and CC amplifiers	1	29-12-17		**TLM1**	CO1	T1, R2	
9.	TUTORIAL-1	1	30-12-17		**TLM1**		T1, R2	
10.	FET Amplifiers: small signal representation of FET	1	03-01-18		**TLM3**	CO1	T1, R2	
11.	Analysis of CS amplifier	1	04-01-18		**TLM1**	CO1	T1, R2	
12.	Analysis of CD,CG amplifier	1	05-01-18		**TLM1**	CO1	T1, R2	
13.	TUTORIAL-2	1	06-01-18		**TLM3**		T1, R2	
14.	Assignment / Quiz-1	1	08-01-18				T1, R2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II : MULTISTAGE AMPLIFIERS, TRANSISTOR AT HIGH FREQUENCIES AND FREQUENCY RESPONSE OF 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
15.	Introduction to UNIT-II	1	10-01-18		**TLM1**	CO2	T1, R2	
16.	Cascade Amplifier, Cascode Amplifier	1	11-01-18		**TLM1**	CO1	T1, R2	
17.	Darlington Pair	1	12-01-18		**TLM1**	CO1	T1, R2	

18.	Importance of boot strap connection in Darlington Pair	1	18-01-18		**TLM1**	CO1	T1, R2	
19.	TUTORIAL-3	1	19-01-18		**TLM3**		T1, R2	
20.	Transistor at High Frequencies : The hybrid π Common Emitter Transistor model	1	20-01-18		**TLM1**	CO2	T1, R2	
21.	Hybrid π conductance in terms of low frequency h parameters	1	22-01-18		**TLM1**	CO2	T1, R2	
22.	The CE short circuit current gain (f_β and f_T parameters), Current gain with resistive load	1	24-01-18		**TLM1**	CO2	T1, R2	
23.	Transistor amplifier response with source resistance-Gain Bandwidth product	1	25-01-18		**TLM1**	CO2	T1, R2	
24.	TUTORIAL-4	1	27-01-18		**TLM3**		T1, R2	
25.	Frequency response of Single stage amplifier	1	29-01-18		**TLM1**	CO2	T1, R2	
26.	Frequency response of multi stage amplifiers	1	31-01-18		**TLM1**	CO2	T1, R2	
27.	Frequency response of FET amplifiers	1	01-02-18		**TLM1**	CO2	T1, R2	
28.	TUTORIAL-5	1	02-02-18		**TLM3**		T1, R2	
29.	Assignment / Quiz-2	1	03-02-18				T1, R2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

UNIT-III : POWER AMPLIFIERS AND TUNED 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
30	Introduction to Unit-III	1	12-02-17		**TLM1**	CO3	T1, R2	
31	Class-A power amplifier – direct couled and Transformer Coupled	1	14-02-18		**TLM1**	CO3	T1, R2	
32	Class- B power amplifier- Push Pull	1	15-02-18		**TLM1**	CO3	T1, R2	
33	Class- B power amplifiers- Complementary Symmetry	1	16-02-18		**TLM1**	CO3	T1, R2	
34	Class-AB power amplifier	1	17-02-18		**TLM1**	CO3	T1, R2	
35	TUTORIAL-6	1	19-02-18		**TLM3**			
36	Class- C power Amplifiers	1	21-02-18		**TLM1**	CO3	T1, R2	
37	Class- D and Class- S power Amplifiers	1	22-02-18		**TLM1**	CO3	T1, R2	
38	Distortion in Amplifiers- Second and higher order	1	23-02-18		**TLM1**	CO3	T1, R2	

	harmonic Distortion							
39	TUTORIAL-7	1	24-02-18		**TLM3**			
40	Tuned amplifiers: Single tuned amplifier	1	26-02-18		**TLM1**	CO3	T1, R2	
41	Double tuned amplifier	1	28-02-18		**TLM1**	CO3	T1, R2	
42	Stagger tuned amplifier	1	01-03-18		**TLM1**	CO3	T1, R2	
43	TUTORIAL-8	1	03-03-18		**TLM3**		T1, R2	
44	Assignment / Quiz-3	1	05-03-18				T1, R2	
No. of classes required to complete UNIT-III		15			No. of classes taken:			

UNIT-IV : FEEDBACK 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
45.	Introduction to UNIT-IV	1	07-03-18		**TLM1**	CO4	T1, R2	
46.	Feedback Amplifiers and it's block diagram representation	1	08-03-18		**TLM1**	CO4	T1, R2	
47.	Concept of negative and positive feedback Amplifiers	1	09-03-18		**TLM1**	CO4	T1, R2	
48.	Characteristics of Negative feedback Amplifiers	1	12-03-18		**TLM1**	CO4	T1, R2	
49.	Voltage Series feedback Amplifier (Block diagram and practical circuit analysis)	1	14-03-18		**TLM1**	CO4	T1, R2	
50.	Current series feedback Amplifier (Block diagram and practical circuit analysis)	1	15-03-18		**TLM1**	CO4	T1, R2	
51.	TUTORIAL-9	1	16-03-18		**TLM3**		T1, R2	
52.	Voltage shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	17-03-18		**TLM1**	CO4	T1, R2	
53.	Current shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	19-03-18		**TLM1**	CO4	T1, R2	
54.	Frequency response of feedback amplifiers	1	21-03-18		**TLM1**	CO4	T1, R2	
55.	Comparison of Voltage Series, Voltage shunt, Current series & Current shunt feedback Amplifier	1	22-03-18		**TLM1**	CO4	T1, R2	
56.	TUTORIAL-10	1	23-03-18		**TLM3**		T1, R2	

57.	Assignment / Quiz-4	1	24-03-18				T1, R2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V: SINUSOIDAL OSCILLATORS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to UNIT-V	1	26-03-18		**TLM1**	CO5	T1, R2	
59.	Classification of Oscillators & Barkhausen Criterion	1	28-03-18		**TLM1**	CO5	T1, R2	
60.	Amplitude Stability of Oscillators, General form of LC oscillator	1	29-03-18		**TLM1**	CO5	T1, R2	
61.	Hartley Oscillator Colpitts Oscillator	1	31-03-18		**TLM1**	CO5	T1, R2	
62.	TUTORIAL-11	1	02-04-18		**TLM3**		T1, R2	
63.	RC phase shift oscillator using BJT	1	04-04-18		**TLM1**	CO5	T1, R2	
64.	RC phase shift oscillator using FET	1	06-04-18		**TLM1**	CO5		
65.	Wein Bridge Oscillator	1	07-04-18		**TLM1**	CO5	T1, R2	
66.	Crystal Oscillator & Frequency Stability of Oscillators	1	09-04-18		**TLM1**	CO5	T1, R2	
67.	TUTORIAL-12	1	11-04-18		**TLM3**		T1, R2	
68.	Assignment / Quiz-5	1	12-04-18				T1, R2	
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
69.	Linear IC Applications	1	13-4-18		**TLM1**			

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	Cos	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	3,4,5	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)		D=5
Cumulative Internal Examination : A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO2: To Function professionally in the rapidly changing world with advances in technology
PEO3: To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO4: To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner

PROGRAMME OUTCOMES (POs)

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2. **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.
PO3. **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.
PO4. **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.
PO5. **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.
PO6. **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.

PO7: **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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: 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.

PO11: 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.

PO12: 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)

PSO1: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

PSO2: 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

PSO3: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Mr.M.Sambasiva Reddy	Mr. B Y V N R Swamy	Dr G Srinivasa Rao	Prof.B.Ramesh Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSE HANDOUT

Part-A

PROGRAM : B.Tech. II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Analog Electronic Circuits – 17EC03

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Mr.A.Anil Kumar Reddy**

COURSE COORDINATOR : **Mr. B Y V N R Swamy**

PRE-REQUISITE: Electronic Devices and Circuits

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course gives the ability to analyze and design analog electronic circuits using discrete components. To empower the students to understand the design, working and analysis of BJT / FET amplifiers using appropriate equivalent models. And it gives the importance and effect of feedback in amplifiers to improve stability and to design oscillators.

COURSE OUTCOMES (CO)

CO1: Design different single stage and multistage amplifiers.
CO2: Understand the effect of capacitances on frequency response.
CO3: Understand the applications of power and tuned amplifiers.
CO4: Know the importance of negative feedback in amplifiers.
CO5: Design Sinusoidal oscillators for different frequencies.

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	2	-
CO2	3	-	2	-	-	-	-	-	-	-	-	-	3	2	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	2	-	2	2	-	-	-	-	-	-	-	-	-	1	-
CO5	3	-	1	-	-	-	-	-	-	-	-	-	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 Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, Publishers, New Delhi, Fourth reprint 2011.

T2 Donald A.Neamen, "Electronic Circuit Analysis and Design",Tata McGraw Hill Publishers, 2nd Edition.

BOS APPROVED REFERENCE BOOKS:

R1 P.John Paul, "Electronic Devices and Circuits", New Age International Publishers.

R2 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson education Publishers, 10th Edition.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT-I : SMALL SIGNAL LOW FREQUENCY AMPLIFIERS & FET 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
1.	Introduction to Subject, Course Outcomes	1	18-12-17		**TLM1**		T1, R2	
2.	Introduction to UNIT-I	1	20-12-17		**TLM1**	CO1	T1, R2	
3.	Hybrid parameter model of a Two Port Network	1	21-12-17		**TLM1**	CO1	T1, R2	
4.	h parameter model for Transistor configurations and Typical h parameter values and h parameter conversion	1	22-12-17		**TLM1**	CO1	T1, R2	
5.	Analysis of CE Amplifier	1	23-12-17		**TLM1**	CO1	T1, R2	
6.	Analysis of CB and CC Amplifier	1	27-12-17		**TLM1**	CO1	T1, R2	
7.	Approximate analysis of CE amplifier with and without bypass capacitor	1	28-12-17		**TLM1**	CO1	T1, R2	
8.	Approximate analysis of CB and CC amplifiers	1	29-12-17		**TLM1**	CO1	T1, R2	
9.	TUTORIAL-1	1	30-12-17		**TLM3**		T1, R2	
10.	FET Amplifiers: small signal representation of FET	1	03-01-18		**TLM1**	CO1		
11.	Analysis of CS amplifier	1	04-01-18		**TLM1**	CO1	T1, R2	
12.	Analysis of CD,CG amplifier	1	05-01-18		**TLM1**	CO1	T1, R2	
13.	TUTORIAL-2	1	06-01-18		**TLM3**		T1, R2	
14.	Assignment / Quiz-1	1	08-01-18					
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II : MULTISTAGE AMPLIFIERS, TRANSISTOR AT HIGH FREQUENCIES AND FREQUENCY RESPONSE OF 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
15.	Introduction to UNIT-II	1	10-01-18		**TLM1**	CO2	T1, R2	
16.	Cascade Amplifier, Cascode Amplifier	1	11-01-18		**TLM1**	CO1	T1, R2	
17.	Darlington Pair	1	12-01-18		**TLM1**	CO1	T1, R2	

18.	Importance of boot strap connection in Darlington Pair	1	18-01-18		**TLM1**	CO1	T1, R2	
19.	TUTORIAL-3	1	19-01-18		**TLM3**		T1, R2	
20.	Transistor at High Frequencies : The hybrid π Common Emitter Transistor model	1	20-01-18		**TLM1**	CO2	T1, R2	
21.	Hybrid π conductance in terms of low frequency h parameters	1	22-01-18		**TLM1**	CO2	T1, R2	
22.	The CE short circuit current gain (f_β and f_T parameters), Current gain with resistive load	1	24-01-18		**TLM1**	CO2	T1, R2	
23.	Transistor amplifier response with source resistance-Gain Bandwidth product	1	25-01-18		**TLM1**	CO2	T1, R2	
24.	TUTORIAL-4	1	27-01-18		**TLM3**		T1, R2	
25.	Frequency response of Single stage amplifier	1	29-01-18		**TLM1**	CO2	T1, R2	
26.	Frequency response of multi stage amplifiers	1	31-01-18		**TLM1**	CO2	T1, R2	
27.	Frequency response of FET amplifiers	1	01-02-18		**TLM1**	CO2	T1, R2	
28.	TUTORIAL-5	1	02-02-18		**TLM3**		T1, R2	
29.	Assignment / Quiz-2	1	03-02-18					
No. of classes required to complete UNIT-II		15			No. of classes taken:			

UNIT-III : POWER AMPLIFIERS AND TUNED 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
30.	Introduction to UNIT III	1	12-02-17		**TLM1**	CO3	T1, R2	
31.	Class-Apower amplifier -direct couled and Transformer Coupled	1	14-02-18		**TLM1**	CO3	T1, R2	
32.	Class- B power amplifier- Push Pull	1	15-02-18		**TLM1**	CO3	T1, R2	
33.	Class- B power amplifiers- Complementary Symmetry	1	16-02-18		**TLM1**	CO3	T1, R2	
34.	Class-AB power amplifier	1	17-02-18		**TLM1**	CO3	T1, R2	
35.	TUTORIAL-6	1	19-02-18		**TLM3**		T1, R2	
36.	Class- C power Amplifiers	1	21-02-18		**TLM1**	CO3	T1, R2	
37.	Class- D and Class- S power Amplifiers	1	22-02-18		**TLM1**	CO3	T1, R2	

38.	Distortion in Amplifiers- Second and higher order harmonic Distortion	1	23-02-18		**TLM1**	CO3	T1, R2	
39.	TUTORIAL-7	1	24-02-18		**TLM3**		T1, R2	
40.	Tuned amplifiers: Single tuned amplifier	1	26-02-18		**TLM1**	CO3	T1, R2	
41.	Double tuned amplifier	1	28-02-18		**TLM1**	CO3	T1, R2	
42.	Stagger tuned amplifier	1	01-03-18		**TLM1**	CO3	T1, R2	
43.	TUTORIAL-8	1	03-03-18		**TLM3**		T1, R2	
44.	Assignment / Quiz-3	1	05-03-18					
No. of classes required to complete UNIT-III		15			No. of classes taken:			

UNIT-IV : FEEDBACK 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
45.	Introduction to UNIT-IV	1	07-03-18		**TLM1**	CO4	T1, R2	
46.	Feedback Amplifiers and it's block diagram representation	1	08-03-18		**TLM1**	CO4	T1, R2	
47.	Concept of negative and positive feedback Amplifiers	1	09-03-18		**TLM1**	CO4	T1, R2	
48.	Characteristics of Negative feedback Amplifiers	1	12-03-18		**TLM1**	CO4	T1, R2	
49.	Voltage Series feedback Amplifier (Block diagram and practical circuit analysis)	1	14-03-18		**TLM1**	CO4	T1, R2	
50.	Current series feedback Amplifier (Block diagram and practical circuit analysis)	1	15-03-18		**TLM1**	CO4	T1, R2	
51.	Voltage shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	16-03-18		**TLM1**	CO4	T1, R2	
52.	Current shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	17-03-18		**TLM1**	CO4	T1, R2	
53.	Frequency response of feedback amplifiers	1	19-03-18		**TLM1**	CO4	T1, R2	
54.	Comparison of Voltage Series, Voltage shunt, Current series & Current shunt feedback Amplifier	1	21-03-18		**TLM1**	CO4	T1, R2	
55.	TUTORIAL-9	1	22-03-18		**TLM3**		T1, R2	

56.	TUTORIAL-10	1	23-03-18		**TLM3**			
57.	Assignment / Quiz-4	1	24-03-18					
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V OSCILLATORS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to UNIT-V	1	26-03-18		**TLM1**	CO5	T1, R2	
59.	Classification of Oscillators & Barkhausen Criterion	1	28-03-18		**TLM1**	CO5	T1, R2	
60.	Amplitude Stability of Oscillators, General form of LC oscillator	1	29-03-18		**TLM1**	CO5	T1, R2	
61.	Hartley Oscillator Colpitts Oscillator	1	31-03-18		**TLM1**	CO5	T1, R2	
62.	TUTORIAL-11	1	02-04-18		**TLM3**		T1, R2	
63.	RC phase shift oscillator using BJT	1	04-04-18		**TLM1**	CO5	T1, R2	
64.	RC phase shift oscillator using FET	1	06-04-18		**TLM1**	CO5		
65.	Wein Bridge Oscillator	1	07-04-18		**TLM1**	CO5	T1, R2	
66.	Crystal Oscillator & Frequency Stability of Oscillators	1	09-04-18		**TLM1**	CO5	T1, R2	
67.	TUTORIAL-12	1	11-04-18		**TLM3**			
68.	Assignment / Quiz-5	1	12-04-18					
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
69.	Linear IC Applications	1	13-4-18					
70.	Linear IC Applications	1	13-4-18					

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	Cos	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	3,4,5	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)		D=5
Cumulative Internal Examination : A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO2: To Function professionally in the rapidly changing world with advances in technology
PEO3: To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO4: To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner

PROGRAMME OUTCOMES (POs)

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2. **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.
PO3. **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.
PO4. **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.
PO5. **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.
PO6. **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.

PO7: **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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: 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.

PO11: 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.

PO12: 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)

PSO1: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

PSO2: 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

PSO3: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Mr.A.Anil Kumar Reddy	Mr. B Y V N R Swamy	Dr G Srinivasa Rao	Prof.B.Ramesh Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY 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

Part-A

PROGRAM : B.Tech., II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Analog Electronic Circuits – 17EC03

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Mr. B Y V N R Swamy**

COURSE COORDINATOR : **Dr. G Srinivasa Rao**

PRE-REQUISITE: Electronic Devices and Circuits

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course gives the ability to analyze and design analog electronic circuits using discrete components. To empower the students to understand the design, working and analysis of BJT / FET amplifiers using appropriate equivalent models. And it gives the importance and effect of feedback in amplifiers to improve stability and to design oscillators.

COURSE OUTCOMES (CO)

CO1: Analyze different amplifier circuits using AC equivalent models.
CO2: Analyze the effect of external and junction capacitors on frequency response of amplifiers.
CO3: Calculate efficiency and figure of merit of power amplifiers.
CO4: Identify the importance of negative feedback in amplifiers.
CO5: Design Sinusoidal oscillators for different frequencies.

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	2	-
CO2	3	-	2	-	-	-	-	-	-	-	-	-	3	2	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	2	-	2	2	-	-	-	-	-	-	-	-	-	1	-
CO5	3	-	1	-	-	-	-	-	-	-	-	-	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 Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, Publishers, New Delhi, Fourth reprint 2011.

T2 Donald A.Neamen, "Electronic Circuit Analysis and Design",Tata McGraw Hill Publishers, 2nd Edition.

BOS APPROVED REFERENCE BOOKS:

R1 P.John Paul, "Electronic Devices and Circuits", New Age International Publishers.

R2 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson education Publishers, 10th Edition.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT-I : SMALL SIGNAL LOW FREQUENCY AMPLIFIERS & FET 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
1.	Introduction to Subject	1	19.12.17		**TLM1**	CO1	T1, R2	
2.	Course Outcomes	1	20.12.17		**TLM1**	CO1	T1, R2	
3.	Introduction to UNIT-I	1	21.1217		**TLM1**	CO1	T1, R2	
4.	Hybrid parameter model of a Two Port Network	1	22.12.17		**TLM1**	CO1	T1, R2	
5.	h parameter model for Transistor in CE, CB and CC configurations and Typical h parameter values and h parameter conversion	1	23.12.17		**TLM1**	CO1	T1, R2	
6.	Analysis of CE Amplifier	1	26.12.17		**TLM1**	CO1	T1, R2	
7.	Analysis of CB and CC Amplifier	1	27.12.17		**TLM1**	CO1	T1, R2	
8.	Approximate analysis of CE amplifier with and without bypass capacitor	1	28.12.17		**TLM1**	CO1	T1, R2	
9.	Approximate analysis of CB and CC amplifiers	1	29.12.17		**TLM1**	CO1	T1, R2	
10.	TUTORIAL-1	1	30.12.17		**TLM3**	CO1		
11.	FET Amplifiers: small signal representation of FET	1	2.1.18		**TLM1**	CO1	T1, R2	
12.	Analysis of CS amplifier	1	3.1.18		**TLM1**	CO1	T1, R2	
13.	Analysis of CD amplifier	1	4.1.18		**TLM1**	CO1	T1, R2	
14.	Analysis of CG amplifier	1	5.1.18		**TLM1**	CO1	T1, R2	
15.	TUTORIAL-2	1	6.1.18		**TLM3**	CO1		
16.	Assignment / Quiz-1	1	9.1.18			CO1		
No. of classes required to complete UNIT-I		16			No. of classes taken:			

UNIT-II : MULTISTAGE AMPLIFIERS, TRANSISTOR AT HIGH FREQUENCIES AND FREQUENCY RESPONSE OF 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
17.	Introduction to UNIT-II	1	10.1.18		**TLM1**	CO2	T1, R2	

18.	Cascade Amplifier	1	11.1.18		**TLM1**	CO2	T1, R2	
19.	Cascode Amplifier	1	12.1.18		**TLM1**	CO2	T1, R2	
20.	Darlington Pair	1	13.1.18		**TLM1**	CO2	T1, R2	
21.	Importance of boot strap connection in Darlington Pair	1	17.1.18		**TLM1**	CO2	T1, R2	
22.	TUTORIAL-3	1	18.1.18		**TLM3**	CO2	T1, R2	
23.	Transistor at High Frequencies : The hybrid π Common Emitter Transistor model	1	19.1.18		**TLM1**	CO2	T1, R2	
24.	Hybrid π conductance in terms of low frequency h parameters	1	20.1.18		**TLM1**	CO2	T1, R2	
25.	The CE short circuit current gain (f_β and f_T parameters)	1	23.1.18		**TLM1**	CO2	T1, R2	
26.	Current gain with resistive load	1	24.1.18		**TLM1**	CO2	T1, R2	
27.	Transistor amplifier response with source resistance-Gain Bandwidth product	1	25.1.18		**TLM1**	CO2	T1, R2	
28.	TUTORIAL-4	1	27.1.18		**TLM3**	CO2	T1, R2	
29.	Frequency response of Single stage amplifier	1	30.1.18		**TLM1**	CO2	T1, R2	
30.	Frequency response of multi stage amplifiers	1	31.1.18		**TLM1**	CO2	T1, R2	
31.	Frequency response of FET amplifiers	1	1.2.18		**TLM1**	CO2	T1, R2	
32.	TUTORIAL-5	1	2.2.18		**TLM3**	CO2		
33.	Assignment / Quiz-2	1	3.2.18			CO2		
No. of classes required to complete UNIT-II		17			No. of classes taken:			

UNIT-III : POWER AMPLIFIERS AND TUNED 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
34	Introduction to UNIT-III	1	10.2.18		**TLM1**	CO3	T1, R2	
35	Class- A power amplifier-Direct coupled	1	14.2.18		**TLM1**	CO3	T1, R2	
36	Class- A power amplifier-Transformer Coupled	1	15.2.18		**TLM1**	CO3	T1, R2	
37	Class- B power amplifier-Push Pull	1	16.2.18		**TLM1**	CO3	T1, R2	
38	Class- B power amplifiers-Complementary Symmetry	1	17.2.18		**TLM1**	CO3	T1, R2	
39	Class-AB power amplifier	1	20.2.18		**TLM1**	CO3	T1, R2	

40	TUTORIAL-6	1	21.2.18		**TLM3**	CO3		
41	Class- C power Amplifiers	1	22.2.18		**TLM1**	CO3	T1, R2	
42	Class- D and Class- S power Amplifiers	1	23.2.18		**TLM1**	CO3	T1, R2	
43	Distortion in Amplifiers- Second and higher order harmonic Distortion	1	24.2.18		**TLM1**	CO3	T1, R2	
44	TUTORIAL-7	1	27.2.18		**TLM3**	CO3		
45	Tuned amplifiers: Single tuned amplifier	1	28.2.18		**TLM1**	CO3	T1, R2	
46	Double tuned amplifier	1	1.3.18		**TLM1**	CO3	T1, R2	
47	Stagger tuned amplifier	1	2.3.18		**TLM1**	CO3	T1, R2	
48	TUTORIAL-8	1	3.3.18		**TLM3**	CO3		
49	Assignment / Quiz-3	1	6.3.18			CO3		
No. of classes required to complete UNIT-III		16			No. of classes taken:			

UNIT-IV : FEEDBACK 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
50.	Introduction to UNIT-IV	1	7.3.18			CO4	T1, R2	
51.	Feedback Amplifiers and it's block diagram representation	1	8.3.18		**TLM1**	CO4	T1, R2	
52.	Concept of negative and positive feedback Amplifiers	1	9.3.18		**TLM1**	CO4	T1, R2	
53.	Characteristics of Negative feedback Amplifiers	1	10.3.18		**TLM1**	CO4	T1, R2	
54.	Voltage Series feedback Amplifier (Block diagram and practical circuit analysis)	1	13.3.18		**TLM1**	CO4	T1, R2	
55.	Current series feedback Amplifier (Block diagram and practical circuit analysis)	1	14.3.18		**TLM1**	CO4	T1, R2	
56.	Voltage shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	15.3.18		**TLM1**	CO4	T1, R2	
57.	Current shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	16.3.18		**TLM1**	CO4	T1, R2	
58.	Frequency response of feedback amplifiers	1	17.3.18		**TLM1**	CO4	T1, R2	
59.	Comparison of Voltage Series, Voltage shunt,	1	20.3.18		**TLM1**	CO4	T1, R2	

	Current series & Current shunt feedback Amplifier							
60.	TUTORIAL-9	1	21.3.18		**TLM3**	CO4		
61.	TUTORIAL-10	1	22.3.18		**TLM3**	CO4		
62.	Assignment / Quiz-4	1	23.3.18			CO4		
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V OSCILLATORS

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.	Introduction to UNIT-V	1	24.3.18		**TLM1**	CO5	T1, R2	
64.	Classification of Oscillators & Barkhausen Criterion	1	27.3.18		**TLM1**	CO5	T1, R2	
65.	Amplitude Stability of Oscillators	1	28.3.18		**TLM1**	CO5	T1, R2	
66.	General form of LC oscillator	1	29.3.18		**TLM1**	CO5	T1, R2	
67.	Hartley Oscillator	1	30.3.18		**TLM1**	CO5	T1, R2	
68.	Colpitts Oscillator	1	31.3.18		**TLM1**	CO5	T1, R2	
69.	TUTORIAL-11	1	3.4.18		**TLM3**	CO5		
70.	RC phase shift oscillator using BJT	1	4.4.18		**TLM1**	CO5	T1, R2	
71.	RC phase shift oscillator using FET	1	5.4.18		**TLM1**	CO5	T1, R2	
72.	Wein Bridge Oscillator	1	6.4.18		**TLM1**	CO5	T1, R2	
73.	Crystal Oscillator & Frequency Stability of Oscillators	1	7.4.18		**TLM1**	CO5	T1, R2	
74.	TUTORIAL-12	1	10.4.18		**TLM3**	CO5		
75.	Assignment / Quiz-5	1	11.4.18			CO5		
No. of classes required to complete UNIT-V		13			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
76.	Linear IC Applications	1	12.4.18					
77.	Linear IC Applications	1	13.4.18					

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	Cos	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	3,4,5	C2=10
Evaluation of Assignment/Quiz Marks: A=(A1+A2+A3+A4+A5)/5	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)		D=5
Cumulative Internal Examination : A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO2: To Function professionally in the rapidly changing world with advances in technology
PEO3: To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO4: To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner

PROGRAMME OUTCOMES (POs)

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2. **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.
PO3. **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.

PO4. **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.

PO5. **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.

PO6. **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.

PO7: **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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: 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.

PO11: 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.

PO12: 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)

PSO1: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

PSO2: 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

PSO3: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Mr. B Y V N R Swamy	Mr. B Y V N R Swamy	Dr G Srinivasa Rao	Prof.B.Ramesh Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSE HANDOUT

Part-A

PROGRAM : B.Tech. II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Digital Electronics Circuits – 17EC04

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr G. Srinivasulu**

COURSE COORDINATOR : **Dr G. Srinivasulu**

PRE-REQUISITE: Concepts of Number systems and fundamentals of transistors

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course provides the knowledge on basic concepts of number system & Boolean algebra, logic gates, realization of combinational and sequential logic circuits, concepts of finite state machines and Algorithmic State Machines charts.

COURSE OUTCOMES (COs)

CO1: Understand number system, Boolean algebra and its applications to design digital circuits.
CO2: Minimize and implement Boolean expressions using logic gates.
CO3: Design combinational circuits using logic gates.
CO4: Design sequential circuits using logic gates.
CO5: Understand concepts of FSM and ASM charts.

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

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

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

BOS APPROVED TEXT BOOKS:

T1 Morris Mano, "Digital Design", PHI Publishers, 4thEdition

BOS APPROVED REFERENCE BOOKS:

R1 Zvi Kohavi, Switching & Finite Automata theory, TMH Publishers, 2nd Edition

R2 Charles H. Roth, "Fundamentals of Logic Design", Cengage learning Publishers.

R3 M. Subramanyam, "Switching Theory and Logic Design", University of Science Press Publishers

R4 John M. Yarbrough, "Digital Logic : Applications and Design", Thomson publications

R4 Ananda kumar, "Switching Theory and Logic Design", PHI Publishers

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

UNIT-I : Number systems and Boolean Algebra

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 Course	1	18.12.2017			CO1	T1	
2.	Number systems	1	19.12.2017			CO1	T1,R4	
3.	Complements	1	20.12.2017			CO1	T1,R4	
4.	Signed binary numbers, Binary arithmetics	1	23.12.2017			CO1	T1	
5.	Binary codes	1	26.12.2017			CO1	T1,R4	
6.	Error detecting & Error correcting codes	1	27.12.2017			CO1	T1,R4	
7.	**Tutorial-1**	1	30.12.2017			CO1	R4	
8.	Hamming codes.	1	01.01.2018			CO1	T1,R4	
9.	Conversion from one code to another codes	1	02.01.2018			CO1	T1,R4	
10.	Boolean postulates	1	03.01.2018			CO1	T1,R4	
11.	Demorgan's theorem	1	06.01.2018			CO1	R4	
12.	Canonical and Standard forms	1	08.01.2018			CO1	R4	
13.	**Tutorial-2**	1	09.01.2018			CO1	R4	
14.	Minimization of switching function	1	10.01.2018			CO1	T1,R4	
15.	Map method, Prime implicants	1	16.01.2018			CO1	T1,R4	
16.	Don't care combinations	1	17.01.2018			CO1	T1,R4	
17.	**Tutorial-3**	1	20.01.2018			CO1	R4	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Logic Gates

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.	Introduction to Logic gates	1	22.01.2018			CO2	T1	
19.	Positive and negative logic	1	23.01.2018			CO2	R4	
20.	Realization of Boolean Functions using gates	1	24.01.2018			CO2	T1,R4	
21.	Multilevel AND/NOR realizations	1	27.01.2018			CO2	T1,R4	
22.	**Tutorial-4**	1	29.01.2018			CO2	R4	
23.	NAND -NAND realizations.	1	30.01.2018			CO2	R4	
24.	NOR –NOR realizations.	1	31.01.2018			CO2	T1,R4	
25.	Realization Resistors and Diodes	1	02.01.2018			CO2	T1,R4	
26.	Realization using Transistor.	1	03.02.2018			CO2	T1,R4	
No. of classes required to complete UNIT-II		09			No. of classes taken:			

UNIT- III : Combinational logic Circuits

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.	Design procedure	1	12.02.2018			CO3	T1	
28.	Adders and Subtractor	1	13.02.2018			CO3	R4	
29.	Serial adder/Subtractor	1	14.02.2018			CO3	R4	
30.	Parallel adder/Subtractor	1	17.02.2018			CO3	R4	
31.	BCD adder,	1	19.02.2018			CO3	R4	
32.	Carry look ahead adder	1	20.02.2018			CO3	R4	
33.	**Tutorial-5**	1	21.02.2018			CO3	R4	
34.	Magnitude Comparator	1	24.02.2018			CO3	T1,R4	
35.	Decoder	1	26.02.2018			CO3	T1,R4	
36.	Encoder	1	27.02.2018			CO3	T1,R4	
37.	Multiplexer	1	28.02.2018			CO3	T1,R4	
38.	De-multiplexer	1	03.03.2018			CO3	T1,R4	
39.	**Tutorial-6**	1	05.03.2018			CO3	R4	
40.	Parity checker	1	06.03.2018			CO3	R4	
41.	Code converters	1	07.03.2018			CO3	R4	
42.	Hazards & elimination	1	12.03.2018			CO3	T1	
43.	Programmable Logic Array	1	13.03.2018			CO3	T1,R4	
44.	Programmable Array Logic	1	14.03.2018			CO3	T1,R4	
45.	Impl.of combinational logic using MUX, PROM, PAL and PLA.	1	15.03.2018			CO3	T1,R4	
No. of classes required to complete UNIT-III		19			No. of classes taken:			

UNIT-IV : Sequential logic Circuits

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.	Latches- SR,D,JK &T	1	17.03.2018			CO4	T1	
47.	Flip flops - SR,D,JK&T	1	19.03.2018			CO4	R4	
48.	Flip flops - JK, T, and Master slave FF	1	20.03.2018			CO4	R4	
49.	**Tutorial - 7**	1	21.03.2018			CO4	R4	
50.	Characteristic tables, equation excitation equations.	1	22.03.2018			CO4	T1,R4	
51.	Modes of triggering	1	23.03.2018			CO4	T1,R4	
52.	Asynchronous counters	1	24.03.2018			CO4	T1,R4	
53.	Synchronous counters	1	26.03.2018			CO4	T1,R4	
54.	Modulo – n counters	1	27.03.2018			CO4	T1,R4	
No. of classes required to complete UNIT-IV		09			No. of classes taken:			

UNIT-V: Finite State Machine and Algorithmic State Machines

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
55.	FSM-capabilities and limitations.	1	28.03.2018			CO5	T1	
56.	Mealy and Moore models	1	31.03.2018			CO5	R4	
57.	Minimization of sequential machines	1	02.04.2018			CO5	T1,R4	
58.	Realization of Sequence detector	1	03.04.2018			CO5	T1,R4	
59.	Conversion between Mealy and Moore	1	04.04.2018			CO5	T1,R4	
60.	Features of the ASM chart Simple examples	1	07.04.2018			CO5	T1,R4	
61.	System design using data path and control subsystems	1	09.04.2018			CO5	T1,R4	
No. of classes required to complete UNIT-V		07			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
62.	Digital design - real time application	1	11.04.2018			C4	T1	

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	COs	Marks
Assignment - 1	1	A1=5
Assignment - 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
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
Quiz -2	3,4,5	C2=10
Evaluation of Assignment Marks: A= average of Best 4 assignments	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)	-	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**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO2: To Function professionally in the rapidly changing world with advances in technology
PEO3: To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices
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PROGRAMME OUTCOMES (POs)

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PO12: 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)

PSO1: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

PSO2: 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

PSO3: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Dr G.Srinivasulu	Dr. G. Srinivasulu	Dr. P. Latchi Reddy	Prof.B.Ramesh Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech. II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Digital Electronics Circuits – 17EC04

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr S.V. Jagadeesh Chandra**

COURSE COORDINATOR : **Dr G. Srinivasulu**

PRE-REQUISITE: Concepts of Number systems and fundamentals of transistors

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course provides the knowledge on basic concepts of number system & Boolean algebra, logic gates, realization of combinational and sequential logic circuits, concepts of finite state machines and Algorithmic State Machines charts.

COURSE OUTCOMES (COs)

CO1: Understand number system, Boolean algebra and its applications to design digital circuits.
CO2: Minimize and implement Boolean expressions using logic gates.
CO3: Design combinational circuits using logic gates.
CO4: Design sequential circuits using logic gates.
CO5: Understand concepts of FSM and ASM charts.

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

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

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

BOS APPROVED TEXT BOOKS:

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BOS APPROVED REFERENCE BOOKS:

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R4 John M. Yarbrough, "Digital Logic : Applications and Design", Thomson publications

R4 Ananda kumar, "Switching Theory and Logic Design", PHI Publishers

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I : Number systems and Boolean Algebra

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 Course	1	18.12.2017		TLM1	CO1	T1	
2.	Number systems	1	19.12.2017		TLM1	CO1	T1,R4	
3.	Complements	1	21.12.2017		TLM1	CO1	T1,R4	
4.	Signed binary numbers, Binary arithmetics	1	23.12.2017		TLM1	CO1	T1	
5.	Binary codes	1	26.12.2017		TLM1	CO1	T1,R4	
6.	Error detecting & Error correcting codes	1	28.12.2017		TLM1	CO1	T1,R4	
7.	**Tutorial-1**	1	30.12.2017		TLM3	CO1	R4	
8.	Hamming codes.	1	01.01.2018		TLM1	CO1	T1,R4	
9.	Conversion from one code to another codes	1	02.01.2018		TLM1	CO1	T1,R4	
10.	Boolean postulates	1	04.01.2018		TLM1	CO1	T1,R4	
11.	Demorgan's theorem	1	06.01.2018		TLM1	CO1	R4	
12.	Canonical and Standard forms	1	08.01.2018		TLM1	CO1	R4	
13.	**Tutorial-2**	1	09.01.2018		TLM3	CO1	R4	
14.	Minimization of switching function	1	11.01.2018		TLM1	CO1	T1,R4	
15.	Map method, Prime implicants	1	17.01.2018		TLM1	CO1	T1,R4	
16.	Don't care combinations	1	18.01.2018		TLM1	CO1	T1,R4	
17.	**Tutorial-3**	1	20.01.2018		TLM3	CO1	R4	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Logic Gates

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.	Introduction to Logic gates	1	22.01.2018		TLM1	CO2	T1	
19.	Positive and negative logic	1	23.01.2018		TLM1	CO2	R4	
20.	Realization of Boolean Functions using gates	1	25.01.2018		TLM1	CO2	T1,R4	
21.	Multilevel AND/NOR realizations	1	27.01.2018		TLM1	CO2	T1,R4	
22.	**Tutorial-4**	1	29.01.2018		TLM3	CO2	R4	
23.	NAND -NAND realizations.	1	30.01.2018		TLM1	CO2	R4	
24.	NOR –NOR realizations.	1	01.02.2018		TLM1	CO2	T1,R4	
25.	Realization Resistors and Diodes	1	03.02.2018		TLM1	CO2	T1,R4	
26.	Realization using Transistor.	1	03.02.2018		TLM1	CO2	T1,R4	

No. of classes required to complete UNIT-II	09	No. of classes taken:

UNIT- III : Combinational logic Circuits

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.	Design procedure	1	10.02.2018		TLM1	CO3	T1	
28.	Adders and Subtractor	1	12.02.2018		TLM1	CO3	R4	
29.	Serial adder/Subtractor	1	15.02.2018		TLM1	CO3	R4	
30.	Parallel adder/Subtractor	1	17.02.2018		TLM1	CO3	R4	
31.	BCD adder, Carry look ahead adder	1	19.02.2018		TLM1	CO3	R4	
32.	**Tutorial-5**	1	20.02.2018		TLM3	CO3	R4	
33.	Magnitude Comparator	1	22.02.2018		TLM3	CO3	R4	
34.	Decoder	1	24.02.2018		TLM1	CO3	T1,R4	
35.	Encoder	1	26.02.2018		TLM1	CO3	T1,R4	
36.	Multiplexer, De-multiplexer	1	27.02.2018		TLM1	CO3	T1,R4	
37.	**Tutorial-6**	1	01.03.2018		TLM1	CO3	T1,R4	
38.	Parity checker	1	03.03.2018		TLM3	CO3	T1,R4	
39.	Code converters	1	05.03.2018		TLM1	CO3	R4	
40.	Hazards & elimination	1	06.03.2018		TLM1	CO3	R4	
41.	Programmable Logic Array	1	08.03.2018		TLM1	CO3	R4	
42.	Programmable Array Logic	1	10.03.2018		TLM1	CO3	T1	
43.	Impl.of combinational logic using MUX, PROM, PAL and PLA.	1	12.03.2018		TLM1	CO3	T1,R4	
No. of classes required to complete UNIT-III		17			No. of classes taken:			

UNIT-IV : Sequential logic Circuits

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.	Introduction to Sequential circuits, latches	1	13.03.2018		TLM1	CO4	T1	
45.	Flip flops - SR,D,JK&T	1	15.03.2018		TLM1	CO4	R4	
46.	Flip flops - JK, T, and Master slave FF	1	17.03.2018		TLM1	CO4	R4	
47.	**Tutorial - 7**	1	19.03.2018		TLM3	CO4	R4	
48.	Characteristic tables, equation excitation equations.	1	20.03.2018		TLM1	CO4	T1,R4	
49.	Conversions of Flip-Flops, modes of triggering	1	22.03.2018					
50.	Asynchronous counters	1	24.03.2018		TLM1	CO4	T1,R4	
51.	Synchronous counters	1	26.03.2018		TLM1	CO4	T1,R4	
52.	Modulo – n counters	1	27.03.2018		TLM1	CO4	T1,R4	

53.	**Tutorial - 8**	1	29.03.2018		TLM1	CO4	T1,R4	
No. of classes required to complete UNIT-IV		10			No. of classes taken:			

UNIT-V: Finite State Machine and Algorithmic State Machines

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
54.	FSM-capabilities and limitations.	1	31.03.2018		TLM1	CO5	T1	
55.	Mealy and Moore models, Minimization of sequential machines	1	02.04.2018		TLM1	CO5	R4	
56.	Realization of Sequence detector	1	03.04.2018		TLM1	CO5	T1,R4	
57.	Conversion between Mealy and Moore	1	06.04.2018		TLM1	CO5	T1,R4	
58.	**Tutorial - 9**	1	07.04.2018		TLM3	CO5	T1,R4	
59.	Features of the ASM chart Simple examples	1	09.04.2018		TLM1	CO5	T1,R4	
60.	System design using data path and control subsystems	1	10.04.2018		TLM1	CO5	T1,R4	
No. of classes required to complete UNIT-V		07			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
61.	Digital design - real time application	1	12.04.2018			C4	T1	

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	COs	Marks
Assignment - 1	1	A1=5
Assignment - 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
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
Quiz -2	3,4,5	C2=10
Evaluation of Assignment Marks: A= average of Best 4 assignments	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)	-	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**

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Dr. S.V. Jagadeesh Chandra	**Dr. G. Srinivasulu**	**Dr. P. Latchi Reddy**	**Prof.B.Ramesh Reddy**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY 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

Part-A

PROGRAM : B.Tech. II-Sem., ECE

ACADEMIC YEAR : 2017-18

COURSE NAME & CODE : Digital Electronics Circuits – 17EC04

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Mr. B. Siva Hari Prasad**

COURSE COORDINATOR : **Dr G. Srinivasulu**

PRE-REQUISITE: Concepts of Number systems and fundamentals of transistors

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course provides the knowledge on basic concepts of number system & Boolean algebra, logic gates, realization of combinational and sequential logic circuits, concepts of finite state machines and Algorithmic State Machines charts.

COURSE OUTCOMES (COs)

CO1: Understand number system, Boolean algebra and its applications to design digital circuits.
CO2: Minimize and implement Boolean expressions using logic gates.
CO3: Design combinational circuits using logic gates.
CO4: Design sequential circuits using logic gates.
CO5: Understand concepts of FSM and ASM charts.

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

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

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

BOS APPROVED TEXT BOOKS:

T1 Morris Mano, "Digital Design", PHI Publishers, 4thEdition

BOS APPROVED REFERENCE BOOKS:

R1 Zvi Kohavi, Switching & Finite Automata theory, TMH Publishers, 2nd Edition

R2 Charles H. Roth, "Fundamentals of Logic Design", Cengage learning Publishers.

R3 M. Subramanyam, "Switching Theory and Logic Design", University of Science Press Publishers

R4 John M. Yarbrough, "Digital Logic : Applications and Design", Thomson publications

R4 Ananda kumar, "Switching Theory and Logic Design", PHI Publishers

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

UNIT-I : Number systems and Boolean Algebra

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 Course	1	26.12.2017			CO1	T1	
2.	Number systems	1	29.12.2017			CO1	T1,R4	
3.	Complements	1	29.12.2017			CO1	T1,R4	
4.	Signed binary numbers, Binary arithmetics	1	30.12.2017			CO1	T1	
5.	Binary codes	1	30.12.2017			CO1	T1,R4	
6.	Error detecting & Error correcting codes	1	02.01.2018			CO1	T1,R4	
7.	**Tutorial-1**	1	03.01.2018			CO1	R4	
8.	Hamming codes.	1	06.01.2018			CO1	T1,R4	
9.	Conversion from one code to another codes	1	08.01.2018			CO1	T1,R4	
10.	Boolean postulates	1	09.01.2018			CO1	T1,R4	
11.	Demorgan's theorem	1	10.01.2018			CO1	R4	
12.	Canonical and Standard forms	1	16.01.2018			CO1	R4	
13.	**Tutorial-2**	1	17.01.2018			CO1	R4	
14.	Minimization of switching function	1	20.01.2018			CO1	T1,R4	
15.	Map method, Prime implicants	1	22.01.2018			CO1	T1,R4	
16.	Don't care combinations	1	23.01.2018			CO1	T1,R4	
17.	**Tutorial-3**	1	24.01.2018			CO1	R4	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II : Logic Gates

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.	Introduction to Logic gates	1	24.01.2018			CO2	T1	
19.	Positive and negative logic	1	25.01.2018			CO2	R4	
20.	Realization of Boolean Functions using gates	1	27.01.2018			CO2	T1,R4	
21.	Multilevel AND/NOR realizations	1	27.01.2018			CO2	T1,R4	
22.	**Tutorial-4**	1	29.01.2018			CO2	R4	
23.	NAND -NAND realizations.	1	30.01.2018			CO2	R4	
24.	NOR –NOR realizations.	1	31.01.2018			CO2	T1,R4	
25.	Realization Resistors and Diodes	1	02.01.2018			CO2	T1,R4	
26.	Realization using Transistor.	1	03.02.2018			CO2	T1,R4	
No. of classes required to complete UNIT-II		09			No. of classes taken:			

UNIT- III : Combinational logic Circuits

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.	Design procedure	1	12.02.2018			CO3	T1	
28.	Adders and Subtractor	1	13.02.2018			CO3	R4	
29.	Serial adder/Subtractor	1	14.02.2018			CO3	R4	
30.	Parallel adder/Subtractor	1	17.02.2018			CO3	R4	
31.	BCD adder,	1	19.02.2018			CO3	R4	
32.	Carry look ahead adder	1	20.02.2018			CO3	R4	
33.	**Tutorial-5**	1	21.02.2018			CO3	R4	
34.	Magnitude Comparator	1	24.02.2018			CO3	T1,R4	
35.	Decoder	1	26.02.2018			CO3	T1,R4	
36.	Encoder	1	27.02.2018			CO3	T1,R4	
37.	Multiplexer	1	28.02.2018			CO3	T1,R4	
38.	De-multiplexer	1	03.03.2018			CO3	T1,R4	
39.	**Tutorial-6**	1	05.03.2018			CO3	R4	
40.	Parity checker	1	06.03.2018			CO3	R4	
41.	Code converters	1	07.03.2018			CO3	R4	
42.	Hazards & elimination	1	12.03.2018			CO3	T1	
43.	Programmable Logic Array	1	13.03.2018			CO3	T1,R4	
44.	Programmable Array Logic	1	14.03.2018			CO3	T1,R4	
45.	Impl.of combinational logic using MUX, PROM, PAL and PLA.	1	15.03.2018			CO3	T1,R4	
No. of classes required to complete UNIT-III		19			No. of classes taken:			

UNIT-IV : Sequential logic Circuits

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.	Latches- SR,D,JK &T	1	17.03.2018			CO4	T1	
47.	Flip flops - SR,D,JK&T	1	19.03.2018			CO4	R4	
48.	Flip flops - JK, T, and Master slave FF	1	20.03.2018			CO4	R4	
49.	**Tutorial - 7**	1	21.03.2018			CO4	R4	
50.	Characteristic tables, equation excitation equations.	1	22.03.2018			CO4	T1,R4	
51.	Modes of triggering	1	23.03.2018			CO4	T1,R4	
52.	Asynchronous counters	1	24.03.2018			CO4	T1,R4	
53.	Synchronous counters	1	26.03.2018			CO4	T1,R4	
54.	Modulo – n counters	1	27.03.2018			CO4	T1,R4	
No. of classes required to complete UNIT-IV		09			No. of classes taken:			

UNIT-V: Finite State Machine and Algorithmic State Machines

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
55.	FSM-capabilities and limitations.	1	28.03.2018			CO5	T1	
56.	Mealy and Moore models	1	31.03.2018			CO5	R4	
57.	Minimization of sequential machines	1	02.04.2018			CO5	T1,R4	
58.	Realization of Sequence detector	1	03.04.2018			CO5	T1,R4	
59.	Conversion between Mealy and Moore	1	04.04.2018			CO5	T1,R4	
60.	Features of the ASM chart Simple examples	1	07.04.2018			CO5	T1,R4	
61.	System design using data path and control subsystems	1	09.04.2018			CO5	T1,R4	
No. of classes required to complete UNIT-V		07			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
62.	Digital design - real time application	1	11.04.2018			C4	T1	

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	COs	Marks
Assignment - 1	1	A1=5
Assignment - 2	1,2	A2=5
I-Mid Examination	1,2	B1=20
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
Quiz -2	3,4,5	C2=10
Evaluation of Assignment Marks: A= average of Best 4 assignments	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 Quiz Marks: C=75% of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D(>95%=5, 90-95%=4,85-90%=3,80-85%=2,75-80%=1)	-	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**

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