LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC & NBA (ASE, CE, CSE, ECE, EEE, IT, ME) (Under Tier - I),
ISO 21001:2018, 50001:2018, 14001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor **:** Dr. K. Bhanu Lakshmi
Course Name & Code **:** Numerical Methods & Integral Calculus & 20FE10
L-T-P Structure **:** 2-1 -0 **Credits:3**
Program/Sem/Sec : II B.Tech/III sem/EEE- A **A.Y.:** 2023 - 24

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to enable the students learn Numerical Techniques for solving the equations and apply interpolation techniques. They will also learn about the Fourier analysis of single valued functions, Multiple Integrals in different coordinate systems and Vector differentiation.

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

CO1	Estimate the best fit polynomial for the given tabulated data using Interpolation.(Understand – L2)
CO2	Apply numerical techniques in solving of equations and evaluation of integrals. (Apply – L3)
CO3	Discriminate among Cartesian, Polar and Spherical coordinates in multiple integrals and their respective applications to areas and volumes. (Apply – L3)
CO4	Generate the single valued functions in the form of Fourier series and obtain Fourier series representation of periodic function. (Apply – L3)
CO5	Evaluate the directional derivative, divergence and angular velocity of a vector function. (Apply – L3)

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

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

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.
T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.
T3 S. S. Sastry, "Introductory Methods of Numerical Analysis" 5th Edition, PHI Learning Private Limited, New Delhi, 2012.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.
R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Interpolation and Finite Differences

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	07/08/23		TLM1	
2.	Introduction to UNIT I	1	08/08/23		TLM2	
3.	Forward Differences	1	10/08/23		TLM1	
4.	Backward differences	1	14/08/23		TLM1	
5.	Central Differences	1	17/08/23		TLM1	
6.	Symbolic relations and separation of symbols	1	19/08/23		TLM1	
7.	Symbolic relations and separation of symbols	1	21/08/23		TLM1	
8.	Newton's forward formulae for interpolation	1	22/08/23		TLM1	
9.	Newton's backward formulae for interpolation	1	24/08/23		TLM1	
10.	Lagrange's Interpolation	1	26/08/23		TLM1	
11.	Lagrange's Interpolation	1	28/08/23		TLM1	
12.	Tutorial I	1	29/08/23		TLM3	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Numerical solutions of Equations and Numerical Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	31/08/23		TLM2	
14.	Algebraic and Transcendental Equations	1	02/09/23		TLM1	
15.	False Position method	1	04/09/23		TLM1	
16.	False Position method	1	05/09/23		TLM1	
17.	Newton- Raphson Method in one variable	1	07/09/23		TLM1	
18.	Newton- Raphson Method applications	1	09/09/23		TLM1	
19.	Trapezoidal rule	1	11/09/23		TLM1	
20.	Simpson's 1/3 Rule	1	12/09/23		TLM1	
21.	Simpson's 3/8 Rule	1	14/09/23		TLM1	
22.	Tutorial II	1	16/09/23		TLM3	
No. of classes required to complete UNIT-II: 10				**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	HOD Sign Weekly
23.	Introduction to Unit-III	1	19/09/23		TLM1	
24.	Double Integrals -Cartesian coordinates	1	21/09/23		TLM1	
25.	Double Integrals- Polar co ordinates	1	23/09/23		TLM1	
26.	Problems	1	25/09/23		TLM1	
27.	Applications to Double integrals (Content Beyond the syllabus)	1	26/09/23		TLM2	
28.	Revision for mid exam	1	30/09/23			
I MID EXAMINATIONS (02-10-2023 TO 07-10-2023)						

29.	Triple Integrals - Cartesian coordinates	1	09/10/23		TLM1	
30.	Triple Integrals - Spherical coordinates	1	10/10/23		TLM1	
31.	Change of order of Integration	1	12/10/23		TLM1	
32.	Tutorial III	1	14/10/23		TLM3	
33.	Change of order of Integration	1	16/10/23		TLM1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Fourier Series

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to UNIT IV	1	17/10/23		TLM1	
35.	Determination of Fourier coefficients, Even and Odd Functions	1	24/10/23		TLM1	
36.	Fourier Series expansion in the interval $[0,2\pi]$	1	26/10/23		TLM1	
37.	Fourier Series expansion in the interval $[-\pi,\pi]$	1	28/10/23		TLM1	
38.	Fourier Series in an arbitrary interval [0, 2l]	1	30/10/23		TLM1	
39.	Fourier Series in an arbitrary interval [-l, l]	1	31/10/23		TLM1	
40.	Fourier series in an arbitrary interval odd and even functions	1	02/11/23		TLM1	
41.	Half-range Sine and Cosine series	1	04/11/23		TLM1	
42.	Half-range Sine and Cosine series		06/11/23		TLM1	
43.	Tutorial IV	1	07/11/23		TLM3	
44.	Introduction to Fourier transforms (Content Beyond the Syllabus)	1	09/11/23		TLM2	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Introduction to UNIT V	1	13/11/23		TLM1	
46.	Vector Differentiation	1	14/11/23		TLM1	
47.	Gradient	1	16/11/23		TLM1	
48.	Directional Derivative	1	18/11/23		TLM1	
49.	Divergence	1	20/11/23		TLM1	
50.	Curl	1	21/11/23		TLM1	
51.	Solenoidal and Irrotational functions, potential surfaces	1	23/11/23		TLM1	
52.	Laplacian and second order operators	1	25/11/23		TLM1	
53.	TUTORIAL - V	1	27/11/23		TLM3	
54.	Properties	1	28/11/23		TLM1	
55.	Properties	1	30/11/23		TLM1	
56.	Introduction to Vector Integrals (Content Beyond the Syllabus)	1	02/12/23		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

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Phone: 08659-222933, Fax: 08659-222931
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor : G. Vijaya Lakshmi
Course Name & Code : Numerical Methods & Integral Calculus & 20FE10
L-T-P Structure : 2-1 -0 **Credits:3**
Program/Sem/Sec : II B.Tech/III sem/EEE- B **A.Y.:** 2023 - 24

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to enable the students learn Numerical Techniques for solving the equations and apply interpolation techniques. They will also learn about the Fourier analysis of single valued functions, Multiple Integrals in different coordinate systems and Vector differentiation.

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

CO1	Estimate the best fit polynomial for the given tabulated data using Interpolation.(Understand – L2)
CO2	Apply numerical techniques in solving of equations and evaluation of integrals. (Apply – L3)
CO3	Discriminate among Cartesian, Polar and Spherical coordinates in multiple integrals and their respective applications to areas and volumes. (Apply – L3)
CO4	Generate the single valued functions in the form of Fourier series and obtain Fourier series representation of periodic function. (Apply – L3)
CO5	Evaluate the directional derivative, divergence and angular velocity of a vector function. (Apply – L3)

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

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

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.
T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.
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R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Interpolation and Finite Differences

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	07/08/23		TLM1	
2.	Introduction to UNIT I	1	09/08/23		TLM2	
3.	Forward Differences	1	11/08/23		TLM1	
4.	Backward differences	1	14/08/23		TLM1	
5.	Central Differences	1	16/08/23		TLM1	
6.	Symbolic relations and separation of symbols	1	18/08/23		TLM1	
7.	Symbolic relations and separation of symbols	1	19/08/23		TLM1	
8.	Newton's forward formulae for interpolation	1	21/08/23		TLM1	
9.	Newton's backward formulae for interpolation	1	23/08/23		TLM1	
10.	Lagrange's Interpolation	1	25/08/23		TLM1	
11.	Lagrange's Interpolation	1	28/08/23		TLM1	
12.	Tutorial I	1	26/08/23		TLM3	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Numerical solutions of Equations and Numerical Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	30/08/23		TLM2	
14.	Algebraic and Transcendental Equations	1	01/09/23		TLM1	
15.	False Position method	1	02/09/23		TLM1	
16.	False Position method	1	04/09/23		TLM1	
17.	Newton- Raphson Method in one variable	1	08/09/23		TLM1	
18.	Newton- Raphson Method applications	1	11/09/23		TLM1	
19.	Trapezoidal rule	1	13/09/23		TLM1	
20.	Simpson's 1/3 Rule	1	15/09/23		TLM1	
21.	Simpson's 3/8 Rule	1	20/09/23		TLM1	
22.	Tutorial II	1	16/09/23		TLM3	
No. of classes required to complete UNIT-II: 10				**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	HOD Sign Weekly
23.	Introduction to Unit-III	1	22/09/23		TLM1	
24.	Double Integrals -Cartesian coordinates	1	23/09/23		TLM1	
25.	Double Integrals- Polar co ordinates	1	25/09/23		TLM1	
26.	Problems	1	27/09/23		TLM1	
27.	Applications to Double integrals (Content Beyond the syllabus)	1	29/09/23		TLM2	
28.	Revision for mid exam	1	30/09/23			
I MID EXAMINATIONS (02-10-2023 TO 07-10-2023)						

29.	Triple Integrals - Cartesian coordinates	1	09/10/23		TLM1	
30.	Triple Integrals - Spherical coordinates	1	11/10/23		TLM1	
31.	Change of order of Integration	1	13/10/23		TLM1	
32.	Tutorial III	1	16/10/23		TLM3	
33.	Change of order of Integration	1	18/10/23		TLM1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Fourier Series

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to UNIT IV	1	25/10/23		TLM1	
35.	Determination of Fourier coefficients, Even and Odd Functions	1	27/10/23		TLM1	
36.	Fourier Series expansion in the interval $[0,2\pi]$	1	28/10/23		TLM1	
37.	Fourier Series expansion in the interval $[-\pi,\pi]$	1	30/10/23		TLM1	
38.	Fourier Series in an arbitrary interval [0, 2l]	1	01/11/23		TLM1	
39.	Fourier Series in an arbitrary interval [-l, l]	1	03/11/23		TLM1	
40.	Fourier series in an arbitrary interval odd and even functions	1	04/11/23		TLM1	
41.	Half-range Sine and Cosine series	1	06/11/23		TLM1	
42.	Half-range Sine and Cosine series		08/11/23		TLM1	
43.	Tutorial IV	1	10/11/23		TLM3	
44.	Introduction to Fourier transforms (Content Beyond the Syllabus)	1	13/11/23		TLM2	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Introduction to UNIT V	1	15/11/23		TLM1	
46.	Vector Differentiation	1	17/11/23		TLM1	
47.	Gradient	1	18/11/23		TLM1	
48.	Directional Derivative	1	20/11/23		TLM1	
49.	Divergence	1	22/11/23		TLM1	
50.	Curl	1	24/11/23		TLM1	
51.	Solenoidal and Irrotational functions, potential surfaces	1	25/11/23		TLM1	
52.	Laplacian and second order operators	1	27/11/23		TLM1	
53.	TUTORIAL - V	1	29/11/23		TLM3	
54.	Properties	1	01/12/23		TLM1	
55.	Introduction to Vector Integrals (Content Beyond the Syllabus)	1	02/12/23		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **O.VENKATA SIVA**
Course Name & Code **: DATA STRUCTURES & 20CS03**
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech. /III/A-sec **A.Y.:** 2023-24

PREREQUISITE: Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.**(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving.(**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.**(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees. (**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques. (**Understand - L2**)

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

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

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	09-08-2023		TLM1	
2.	Classification of Data Structures	1	10-08-2023		TLM1	
3.	Introduction to Algorithm	1	11-08-2023		TLM1	
4.	Algorithm Analysis	1	12-08-2023		TLM1	
5.	Asymptotic Notations	1	16-08-2023		TLM1	
6.	List using Arrays	1	17-08-2023		TLM1	
7.	Single Linked List	3	18-08-2023, 19-08-2023 23-08-2023		TLM1	
8.	Double Linked List	3	24-08-2023 25-08-2023 26-08-2023		TLM1	
9.	Circular Linked List	2	30-08-2023 31-08-2023		TLM1	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	01-09-2023		TLM2	
11.	STACKS USING ARRAYS	1	02-09-2023		TLM1	
12.	STACKS USING LINKED LIST	1	06-09-2023		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	07-09-2023 & 08-09-2023		TLM1	
14.	POSTFIX EVALUTION	1	09-09-2023		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	13-09-2023		TLM1	
16.	QUEUE	1	14-09-2023		TLM1	
17.	QUEUE USING ARRAY	1	15-09-2023		TLM1	
18.	QUEUE USING LINKED LIST	1	16-09-2023		TLM1	
19.	CIRCULAR QUEUE	2	20-09-2023		TLM1	
20.	DEQUE	1	21-09-2023		TLM1	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: SORTING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Bubble sort	1	22-09-2023		TLM2	
22.	Insertion Sort	1	23-09-2023		TLM1	
23.	Selection Sort	1	27-09-2023		TLM1	
24.	Merge Sort	2	28-09-2023 & 29-09-2023		TLM1	
25.	Quick Sort	2	30-09-2023 & 11-10-2023		TLM1	
26.	Heap Sort	2	12-10-2023 & 13-10-2023		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Introduction	1	14-10-2023		TLM1	
28.	Tree Traversals	2	18-10-2023 & 19-10-2023		TLM1	
29.	Binary Trees	1	20-10-2023		TLM2	
30.	Binary Search Trees	2	21-10-2023 & 25-10-2023		TLM1	
31.	AVL Trees	1	26-10-2023		TLM1	
32.	Operations	1	27-10-2023		TLM1	
No. of classes required to complete UNIT-IV: 08				**No. of classes taken:**		

UNIT-V: GRAPHS & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	GRAPHS, FUNDAMENTALS	1	01-11-2023 02-11-2023		TLM1	
34.	REPRESENTATION OF GRAPHS	1	03-11-2023 04-11-2023		TLM1	
35.	BFS	1	08-11-2023 09-11-2023		TLM1	
36.	DFS	1	10-11-2023 11-11-2023 15-11-2023 16-11-2023		TLM1	
37.	Hashing Introduction, Hash function, separate Chaining	1	17-11-2023 22-11-2023 23-11-2023 24-11-2023		TLM1	
38.	Linear & Quadratic Probing	1	25-11-2023		TLM1	

			29-11-2023			
39.	Double & Rehasing	1	30-11-2023 01-12-2023 02-12-2023		TLM2	
No. of classes required to complete UNIT-V: 19				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. O.Venkata Siva**	**Dr. K. N. Prashanthi**	**Dr. Y Vijaya Bhaskar Redddy**	**Dr. D.Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: M.SWATHI
Course Name & Code : DATA STRUCTURES & 20CS03
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech. /III/B-sec **A.Y.:** 2023-24

PREREQUISITE: Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

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

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.**(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving.(**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.**(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques.(**Understand - L2**)

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

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

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	08-08-2023		TLM1	
2.	Classification of Data Structures	1	08-08-2023		TLM1	
3.	Introduction to Algorithm	1	10-08-2023		TLM1	
4.	Algorithm Analysis	1	11-08-2023		TLM1	
5.	Asymptotic Notations	1	17-08-2023		TLM1	
6.	List using Arrays	1	18-08-2023		TLM1	
7.	Single Linked List	3	19-08-2023 22-08-2023 24-08-2023		TLM1	
8.	Double Linked List	3	26-08-2023 29-08-2023 31-08-2023		TLM1	
9.	Circular Linked List	2	01-09-2023 02-09-2023		TLM1	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	05-09-2023		TLM2	
11.	STACKS USING ARRAYS	1	07-09-2023		TLM1	
12.	STACKS USING LINKED LIST	1	08-09-2023		TLM1	
13.	INFIX TO POSTFIX CONVERSION	1	12-09-2023		TLM1	
14.	POSTFIX EVALUTION	1	14-09-2023		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	15-09-2023		TLM1	
16.	QUEUE	1	16-09-2023		TLM1	
17.	QUEUE USING ARRAY	1	19-09-2023		TLM1	
18.	QUEUE USING LINKED LIST	1	21-09-2023		TLM1	
19.	CIRCULAR QUEUE	1	22-09-2023		TLM1	
20.	DEQUE	1	23-09-2023		TLM1	
No. of classes required to complete UNIT-II: 11				**No. of classes taken:**		

UNIT-III: SORTING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Bubble sort	1	26-09-2023		TLM2	
22.	Insertion Sort	1	29-09-2023		TLM1	
23.	Selection Sort	1	30-09-2023		TLM1	
24.	Merge Sort	1	10-10-2023		TLM1	
25.	Quick Sort	1	12-10-2023		TLM1	
26.	Heap Sort	2	13-10-2023 17-10-2023		TLM1	
No. of classes required to complete UNIT-III: 07				**No. of classes taken:**		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Introduction	1	19-10-2023		TLM1	
28.	Tree Traversals	1	20-10-2023		TLM1	
29.	Binary Trees	1	21-10-2023		TLM2	
30.	Binary Search Trees	2	26-10-2023 27-10-2023		TLM1	
31.	AVL Trees	2	28-10-2023 31-10-2023		TLM1	
32.	Operations	1	02-11-2023		TLM1	
No. of classes required to complete UNIT-IV: 08				**No. of classes taken:**		

UNIT-V: GRAPHS & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	GRAPHS, FUNDAMENTALS	1	03-11-2023		TLM1	
34.	REPRESENTATION OF GRAPHS	2	04-11-2023 07-11-2023		TLM1	
35.	BFS	2	09-11-2023 10-11-2023		TLM1	
36.	DFS	2	14-11-2023 16-11-2023		TLM1	

37.	Hashing Introduction, Hash function, separate Chaining	1	18-11-2023		TLM1	
38.	Linear & Quadratic Probing	1	23-11-2023		TLM1	
39.	Double & Rehasing	2	24-11-2023 30-12-2023		TLM2	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Ms.M.Swathi**	**Mr D.Anil Kumar**	**Dr. Y Vijaya Bhaskar Redddy**	**Dr. D.Veeraiah**
Signature				

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DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.K.R.L.Prasad
Course Name & Code **:** Electrical Circuit Analysis &20EE05
L-T-P Structure **:** 2-1-0 **Credits:** 3
Program/Sem/Sec : B.Tech/III Sem/A **A.Y.:** 2023-24

PREREQUISITE:FEE (20EE02)

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is study of three phase circuits, transient analysis, Fourier analysis of circuits, filters and two port network parameters.

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

CO1	Analyze electrical circuits using theorems (Apply-L3))
CO2	Evaluate transient response of electrical circuits (Understand-L2
CO3	Examine the performance of three phase circuits (Understand-L2)
CO4	Evaluate the two-port network parameters (Apply-L3)
CO5	Apply Fourier series to the electrical circuits excited by non sinusoidal inputs (Apply-L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2													
CO2	2	2	2													
CO3	2	2	2									2				
CO4	2	2	2									2			2	2
CO5	2	2	2									2			2	2
1 - Low					**2** –Medium							**3** - High				

TEXTBOOKS:

T: William Hayt and Jack E.Kemmerley, “Engineering Circuit Analysis” ,Mc Graw Hill Company, 9th edition,2020

T2: .C.L.Wadhwa, “Network Analysis And Synthesis”, New Age International publication, 3 rd edition,2018.

REFERENCE BOOKS:

R1: Van Valkenburg, “Network Analysis and Synthesis”, Pearson publication, 3rd edition,2015

R2: A. Sudhakar ,Shyammohan, S Palli, “Electrical Circuits Analysis-2” Tata McGraw- Hill, 5th edition,2015

R3: Charles K Alexander, Mathew. N. O.Sadiku, “Fundamental of Electric Circuits”, Tata McGrawHill ,6th edition,2019.

R4: Chakrabarti A,“Electric Circuits Analysis & Synthesis “ Dhanpat Rai & Co (p) Ltd, 6th edition,2014

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: NETWORK THEOREMS (DC & AC EXCITATIONS)

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction	1	07-08-2023		TLM1	
2	Superposition theorem	1	08-08-2023		TLM1	
3	Thevenin's theorem	1	09-08-2023		TLM1	
4	Norton theorem	1	10-08-2023		TLM1	
5	Maximum Power Transfer theorem	1	14-08-2023		TLM1	
6	Tutorial	1	16-08-2023		TLM3	
7	Millman's theorem	1	17-08-2023		TLM2	
8	Reciprocity theorem	1	21-08-2023		TLM2	
9	Compensation theorem	1	22-08-2023		TLM2	
10	Tutorial	1	23-08-2023		TLM3	
11	Concept of duality and dual networks	1	24-08-2023		TLM1	
No. of classes required to complete UNIT-I:				**No. of classes taken:**		

UNIT-II: TRANSIENT ANALYSIS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12	Initial conditions & Laplace transforms	1	28-08-2023		TLM1	
13	Transient response of RL(DC & AC)	1	29-08-2023		TLM1	
14	Tutorial	1	30-08-2023		TLM3	
15	Transient response of RL(DC & AC)	1	31-08-2023		TLM1	
16	Transient response of RC(DC & AC)	1	04-09-2023		TLM1	
17	Transient response of RLC(DC & AC)	1	05-09-2023		TLM1	
18	Tutorial	1	06-09-2023		TLM3	
19	Transient response of RLC(DC & AC)	1	07-09-2023		TLM1	
20	Analysis of Electrical circuits (Step)	1	11-09-2023		TLM1	
21	Analysis of Electrical circuits(Impulse)	1	12-09-2023		TLM1	
22	Tutorial	1	13-09-2023		TLM3	
No. of classes required to complete UNIT-II:				**No. of classes taken:**		

UNIT-III: THREE PHASE CIRCUITS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23	Phase sequence,Star-Delta Connection	1	14-09-2023		TLM2	
24	V-I relations in balanced circuits	1	18-09-2023		TLM2	
25	Tutorial	1	20-09-2023		TLM3	
26	Three phase balanced circuits	1	21-09-2023		TLM1	
27	Three phase balanced circuits	1	25-09-2023		TLM1	
28	Three phase balanced circuits	1	26-09-2023		TLM1	
29	Tutorial	1	27-09-2023		TLM3	
30	Three phase unbalanced circuits	1	28-09-2023		TLM1	
31	Three phase unbalanced circuits	1	03-10-2023		TLM1	
32	Tutorial	1	04-10-2023		TLM3	
33	Three phase unbalanced circuits	1	05-10-2023		TLM1	
34	Measurement of power	1	09-10-2023		TLM1	
35	Measurement of power	1	10-10-2023		TLM4	
36	Tutorial	1	11-10-2023		TLM3	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT-IV: TWO PORT NETWORKS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37	Two port network parameters	1	12-10-2023		TLM1	
38	Z parameters	1	16-10-2023		TLM1	
39	Y parameters	1	17-10-2023		TLM1	
40	Tutorial	1	18-10-2023		TLM3	
41	Tutorial	1	25-10-2023		TLM3	
42	ABCD parameters	1	26-10-2023		TLM1	
43	Hybrid parameters	1	30-10-2023		TLM1	
44	Relationship between parameters	1	31-10-2023		TLM2	
45	Tutorial	1	01-11-2023		TLM3	
46	Interconnection of two port networks	1	02-11-2023		TLM1	
47	Interconnection of two port networks	1	06-11-2023		TLM2	
No. of classes required to complete UNIT-IV:				**No. of classes taken:**		

UNIT-V: FOURIER ANALYSIS OF A.C. CIRCUITS AND FILTERS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48	Introduction to Fourier Series	1	07-11-2023		TLM1	
49	Tutorial	1	08-11-2023		TLM3	
50	Analysis of Electrical Circuits	1	09-11-2023		TLM1	
51	Analysis of Electrical Circuits	1	13-11-2023		TLM1	
52	Analysis of Electrical Circuits	1	14-11-2023		TLM1	
53	Tutorial	1	15-11-2023		TLM3	
54	Low pass Filter	1	16-11-2023		TLM2	
55	High pass Filter	1	20-11-2023		TLM2	
56	Band pass filters	1	21-11-2023		TLM2	
57	Tutorial	1	22-11-2023		TLM3	
58	Constant-k Low pass filters	1	23-11-2023		TLM2	
59	Constant-k High pass filters	1	27-11-2023		TLM2	
60	m-derived filters	1	28-11-2023		TLM2	
61	Tutorial	1	29-11-2023		TLM3	
No. of classes required to complete UNIT-V:				**No. of classes taken:**		

Content Beyond Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods
62		1	30-11-2023	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 (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	**Course Instructor**	**Module Coordinator**	**Program Coordinator**
Name of the Faculty			
Signature			

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

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

Course Name & Code **:** Electrical Circuit Analysis &20EE05

L-T-P Structure **:** 2-1-0 **Credits:** 3

Program/Sem/Sec : B.Tech/III Sem/B **A.Y.:** 2023-24

PREREQUISITE: FEE (20EE02)

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is study of three phase circuits, transient analysis, Fourier analysis of circuits, filters and two port network parameters.

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

CO1	Analyze electrical circuits using theorems (Apply-L3))
CO2	Evaluate transient response of electrical circuits (Understand-L2
CO3	Examine the performance of three phase circuits (Understand-L2)
CO4	Evaluate the two-port network parameters (Apply-L3)
CO5	Apply Fourier series to the electrical circuits excited by non sinusoidal inputs (Apply-L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2													
CO2	2	2	2													
CO3	2	2	2									2				
CO4	2	2	2									2			2	2
CO5	2	2	2									2			2	2
1 - Low					**2** –Medium							**3** - High				

TEXTBOOKS:

T: William Hayt and Jack E.Kemmerley, “Engineering Circuit Analysis” ,Mc Graw Hill Company, 9th edition,2020

T2: .C.L.Wadhwa, “Network Analysis And Synthesis”, New Age International publication, 3 rd edition,2018.

REFERENCE BOOKS:

R1: Van Valkenburg, “Network Analysis and Synthesis”, Pearson publication, 3rd edition,2015

R2: A. Sudhakar ,Shyammohan, S Palli, “Electrical Circuits Analysis-2” Tata McGraw- Hill, 5th edition,2015

R3: Charles K Alexander, Mathew. N. O.Sadiku, “Fundamental of Electric Circuits”, Tata McGrawHill ,6th edition,2019.

R4: Chakrabarti A,“Electric Circuits Analysis & Synthesis “ Dhanpat Rai & Co (p) Ltd, 6th edition,2014

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: NETWORK THEOREMS (DC & AC EXCITATIONS)

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Intoduction	1	07-08-2023		TLM1	
2	Superposition theorem	1	09-08-2023		TLM1	
3	Thevenin theorem	1	10-08-2023		TLM1	
4	Norton theorem	1	11-08-2023		TLM1	
5	Tutorial	1	14-08-2023		TLM3	
6	Maximum Power Transfer theorem	1	16-08-2023		TLM1	
7	Millman theorem	1	17-08-2023		TLM2	
8	Reciprocity theorem	1	18-08-2023		TLM2	
9	Tutorial	1	21-08-2023		TLM3	
10	Compensation theorem	1	23-08-2023		TLM2	
11	Concept of duality and dual networks	1	24-08-2023		TLM1	
No. of classes required to complete UNIT-I:				**No. of classes taken:**		

UNIT-II: TRANSIENT ANALYSIS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12	Initial conditions & Laplace transforms	1	25-08-2023		TLM1	
13	Tutorial	1	28-08-2023		TLM3	
14	Transient response of RL(DC & AC)	1	30-08-2023		TLM1	
15	Transient response of RL(DC & AC)	1	31-08-2023		TLM1	
16	Transient response of RC(DC & AC)	1	01-09-2023		TLM1	
17	Tutorial	1	04-09-2023		TLM3	
18	Transient response of RLC(DC & AC)	1	06-09-2023		TLM1	
19	Transient response of RLC(DC & AC)	1	07-09-2023		TLM1	
20	Analysis of Electrical circuits (Step)	1	08-09-2023		TLM1	
21	Tutorial	1	11-09-2023		TLM3	
22	Analysis of Electrical circuits (Impulse)	1	13-09-2023		TLM1	
No. of classes required to complete UNIT-II:				**No. of classes taken:**		

UNIT-III: THREE PHASE CIRCUITS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23	Phase sequence,Star-Delta Connection	1	14-09-2023		TLM2	
24	V-I relations in balanced circuits	1	18-09-2023		TLM2	
25	Tutorial	1	20-09-2023		TLM3	
26	Three phase balanced circuits	1	21-09-2023		TLM1	
27	Three phase balanced circuits	1	25-09-2023		TLM1	
28	Three phase balanced circuits	1	26-09-2023		TLM1	
29	Tutorial	1	27-09-2023		TLM3	
30	Three phase unbalanced circuits	1	28-09-2023		TLM1	
31	Three phase unbalanced circuits	1	03-10-2023		TLM1	
32	Tutorial	1	04-10-2023		TLM3	
33	Three phase unbalanced circuits	1	05-10-2023		TLM1	
34	Measurement of power	1	09-10-2023		TLM1	
35	Measurement of power	1	10-10-2023		TLM4	
36	Tutorial	1	11-10-2023		TLM3	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT-IV: TWO PORT NETWORKS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37	Two port network parameters	1	10-10-2023		TLM1	
38	Z parameters	1	12-10-2023		TLM1	
39	Tutorial	1	13-10-2023		TLM3	
40	Y parameters	1	16-10-2023		TLM1	
41	ABCD parameters	1	18-10-2023		TLM1	
42	Hybrid parameters	1	25-10-2023		TLM2	
43	Tutorial	1	26-10-2023		TLM3	
44	Relationship between parameters	1	27-10-2023		TLM2	
45	Relationship between parameters	1	30-10-2023		TLM3	
46	Interconnection of two port networks	1	01-11-2023		TLM1	
47	Interconnection of two port networks	1	02-11-2023		TLM1	
48	Tutorial	1	03-11-2023		TLM3	
No. of classes required to complete UNIT-IV:				**No. of classes taken:**		

UNIT-V: FOURIER ANALYSIS OF A.C. CIRCUITS AND FILTERS

S.No	Topics to be Covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
49	Introduction to Fourier Series	1	06-11-2023		TLM1	
50	Analysis of Electrical Circuits	1	08-11-2023		TLM1	
51	Analysis of Electrical Circuits	1	09-11-2023		TLM2	
52	Tutorial	1	10-11-2023		TLM3	
53	Analysis of Electrical Circuits	1	13-11-2023		TLM2	
54	Low pass Filter	1	15-11-2023		TLM2	
55	High pass Filter	1	16-11-2023		TLM2	
56	Tutorial	1	17-11-2023		TLM3	
57	Band pass filters	1	20-11-2023		TLM2	
58	Constant-k Low pass filters	1	22-11-2023		TLM2	
59	Constant-k High pass filters	1	23-11-2023		TLM2	
60	Tutorial	1	24-11-2023		TLM3	
61	m-derived filters	1	27-11-2023		TLM2	
62	Revision	1	29-11-2023		TLM2	
63	Revision	1	30-11-2023		TLM2	
No. of classes required to complete UNIT-V:				**No. of classes taken:**		

Content Beyond Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods
64		1	01-12-2023	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 (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	**Course Instructor**	**Module Coordinator**	**Program Coordinator**
Name of the Faculty			
Signature			

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DEPARTMENT OF EEE

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. M. Uma Vani
Course Name & Code **:** Digital Electronics (20EE06)
L-T-P Structure **:** 2-1-0 **Credits:** 3
Program/Sem/Sec : B.Tech/III/A & B **A.Y.: 2023-24**
PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this course is to introduce the number systems, Boolean algebra, and digital logic circuit design of both combinational and sequential (SSI/MSI/LSI/VLSI) circuits, using logic gates, and PLDs**.**

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

CO1	Interpret the number systems **(Remember-L1)**
CO2	Design digital logic circuits **(Apply-L3)**
CO3	Analyze combinational and sequential logic circuits **(Understand-L2)**
CO4	Realize Memory Organization and state machines **(Understand-L2)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	2		2										3
CO 2	3	2	3		2										3
CO 3	3	2	3		2										3
CO 4	3														3
1 - Low								**2** –Medium					**3** - High		

TEXTBOOKS:

1. Morris Mano, Michael D. Ciletti ,"Digital Design with an Introduction to the Verilog HDL", Pearson Education, New Jersey, 5th edition, 2013.
2. Zvi Kohavi, Niraj K. Jha, "Switching and Finite Automata Theory", Cambridge University Press, New York, 3rd edition, 2010.

REFERENCE:

1. John F. Wakerly, "Digital Design", Pearson Education ,New Delhi, 4th edition, 2014.
2. Thomas L. Floyd, "Digital Fundamentals", Pearson Education, New Jersey,11th edition, 2015.
3. Charles H. Roth, Larry.L.Kinney, "Fundamentals of Logic Design", Cengage learning Publishers,7th edition,2015.
4. M.V.Subramanyam, "Switching Theory and Logic Design", Laxmi Publications(P) Ltd. New Delhi,2011.
5. A. Anand Kumar, "Switching Theory and Logic Design", PHI Publishers,New Delhi, 3rd edition, 2016.
6. Comer, "Digital Logic and State Machine Design", Oxford Higher Education, 3rd edition 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN-A/Sec) (Commencement of Classwork:08-08-2023 to 09-12-2023)

UNIT-I: Number Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Course and learning Outcomes	1	7-8-2023		TLM1/2	
2.	Number Systems introduction	1	8-8-2023		TLM1/2	
3.	Conversions of number systems	1	11-8-2023		TLM1/2	
4.	Complements--signed and unsigned binary numbers	1	14-8-2023		TLM1/2	
5.	Binary arithmetic	1	18-8-2023		TLM1/2	
6.	Binary codes-BCD,Gray	**1**	19-8-2023		TLM1/2	
7.	Excess-3, ASCII/EBCDIC **Tutorial-1**	2	21-8-20223 22-8-2023		TLM1/2, **TLM3**	
8.	Binary code conversions	1	25-8-2023		TLM1/2	
9.	Arithmetic operations – D, O, & H systems	**1**	26-8-2023		TLM3	
10.	Parity bits, Error detection and correction code-Hamming code	2	28-8-2023, 29-8-2023		TLM1/2	
11.	Boolean algebra-Boolean postulates	1	1-9-2023		TLM1/2	
12.	De Morgan's theorem, duality	1	2-9-2023		TLM1/2	
13.	Canonical forms-SOP form	1	4-9-2023		TLM1/2	
14.	Canonical forms-POS form	1	5-9-2023		TLM1/2	
15.	K-Map minimisation upto 5 variables	1	8-9-2023		TLM1/2	
16.	**Quiz /Tutorial-2**	**1**	**11-9-2023**		**TLM3**	
17.	K-map minimisation with don't care conditions	1	12-9-2023		TLM1/2	
No. of classes required to complete UNIT-I: 19				**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	HOD Sign Weekly
18.	Basic Gates- AND,OR, NOT, EXOR, EXNOR	2	15-9-2023, 16-9-2023		TLM1/2	
19.	Universal gates NAND, NOR	1	18-9-2023		TLM1/2	
20.	2-level logic gate implementation (AND-OR,OR-AND)	1	22-9-2023		TLM1/2	
21.	2-level logic gate implementation (NAND only, NOR only)	2	23-9-2023, 25-9-2-23		TLM1/2	
22.	Multi-level logic gate implementation AND-OR,OR-AND, NAND only, NOR only; **Tutorial-3**	2	26-9-2023, 29-9-2023		TLM1/2, **TLM3**	
23.	Implementation of AND, OR, NAND, NOR, NOT gates using resistors, diodes, and transistors	2	30-9-2023 **To plan Extra hour**		TLM1/2	
No. of classes required to complete UNIT-II: 11				**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	HOD Sign Weekly
24.	Design procedures- adders, subtractors	1	**To plan Extra hour**		TLM1/2	
25.	Serial adder/ subtractor	1	**To plan Extra**		TLM1/2	

			hour			
26.	Parallel adder/ subtractor	1	**To plan Extra hour**		TLM1/2	
27.	**Mid-I from 02-10-2023 to 7-10-2023**					
28.	Carry look ahead adder	1	13-10-2023		TLM1/2	
29.	BCD adder	1	16-10-2023		TLM1/2	
30.	Magnitude comparator	1	17-10-2023		TLM1/2	
31.	Decoder, Encoder	1	27-10-2023		TLM1/2	
32.	Multiplexer	**1**	28-10-2023		TLM1/2	
33.	Demultiplexer	1	30-10-2023		TLM1/2	
34.	Parity generator/checker	1	31-10-2023		TLM1/2	
35.	**Tutorial-4**	**1**	**3-11-2023**		**TLM3**	
36.	Code converters	1	4-11-2023		TLM1/2	
37.	Memories-RAM,ROM,	1	6-11-2023		TLM1/2	
38.	PAL, PLA	1	7-11-2023		TLM1/2	
39.	**Tutorial-5**	**1**	**10-11-2023**		**TLM3**	
40.	Implementation of combinational logic using MUX, PROM	1	13-11-2023		TLM1/2	
41.	Implementation of combinational logic using PLA and PAL	**1**	14-11-2023		TLM1/2	
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	HOD Sign Weekly
42.	Latches, flipflops-JK,SR	2	17-11-2023, 18-11-2023		TLM1/2	
43.	Latches, flipflops-D,T	1	20-11-2023		TLM1/2	
44.	Master-slave FF, characteristic equations and excitation tables	**1**	21-11-2023		TLM1/2	
45.	**Tutorial-6**	**1**	**24-11-2023**		**TLM3**	
46.	Modes of triggering-edge and level triggering	1	25-11-2023		TLM1/2	
47.	Realisation of one flip flop using other FFs	1	27-11-2023		TLM1/2	
48.	Registers and their operation-Synchronous and asynchronous counters	1	28-11-2023		TLM1/2	
49.	Modulo-n counter, race around condition	1	1-12-2023		TLM1/2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Asynchronous Sequential Circuits

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Sequence detector, FSM capabilities and limitations	2	2-12-2023 **To plan Extra hour**		TLM1/2	
51.	Mealy and Moore models-Problems	1	**To plan Extra hour**		TLM1/2	
52.	Design of sequential circuits	**1**	**To plan Extra hour**		TLM1/2	
53.	Algorithmic state machines	1	**To plan Extra hour**		TLM1/2	
54.	Components of ASM chart	1	**To plan Extra hour**		TLM1/2	
55.	Salient features of ASM chart, ASM examples	**1**	**To plan Extra hour**		**TLM1/2**	
No. of classes required to complete UNIT-V: 7				**No. of classes taken:**		
Mid-II from 04-12-2023 to 09-12-2023						

COURSE DELIVERY PLAN (LESSON PLAN-B/Sec)

(Commencement of Classwork: 08-08-2023 to 09-12-2023)

UNIT-I: Number Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Course and learning Outcomes	1	8-8-2023		TLM1/2	
2.	Number Systems introduction	1	9-8-2023		TLM1/2	
3.	Conversions of Number systems	1	11-8-2023		TLM1/2	
4.	Complements-signed and unsigned binary numbers	1	16-8-2023		TLM1/2	
5.	**Tutorial-1**	**1**	**18-8-2023**		**TLM3**	
6.	Binary arithmetic	**1**	19-8-2023		TLM1/2	
7.	Binary codes-BCD,Gray,Excess-3,ASCII/EBCDIC	2	22-8-20223 23-8-2023		TLM1/2	
8.	Binary code conversions	1	25-8-2023		TLM1/2	
9.	Parity bits	1	26-8-2023		TLM1/2	
10.	Error detection and correction code-Hamming code	1	29-8-2023, 30-8-2023		TLM1/2	
11.	Boolean algebra-Boolean postulates	1	1-9-2023		TLM1/2	
12.	De Morgan's theorem, duality	1	2-9-2023		TLM1/2	
13.	Canonical forms-SOP form	**1**	5-9-2023		TLM1/2	
14.	Canonical forms-POS form	1	6-9-2023		TLM1/2	
15.	**Tutorial-2/Quiz**	**1**	**8-9-2023**		**TLM3**	
16.	K-Map minimisation upto 5 variables	**1**	12-9-2023		TLM1/2	
17.	K-map minimisation with don't care conditions	1	13-9-2023		TLM1/2	
18.	Basic Gates- AND,OR, NOT	**1**	15-9-2023		TLM1/2	
No. of classes required to complete UNIT-I: 19				**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	HOD Sign Weekly
19.	EXOR, EXNOR gates, Universal gates_NAND, NOR	2	16-9-2023, 20-9-2023		TLM1/2	
20.	2-level logic gate implementation (AND-OR, OR-AND)	1	22-9-2023		TLM1/2	
21.	**Tutorial-3**	**1**	**23-9-2023**		**TLM3**	
22.	2-level logic gate implementation (NAND only, NOR only)	2	26-9-2023, 27-9-2-23		TLM1/2	
23.	Multi-level logic gate implementation AND-OR, OR-AND, NAND only, NOR only	2	29-9-2023, 30-9-2023		TLM1/2	
24.	Implementation of AND, OR, NAND, NOR, NOT gates using resistors, diodes, and transistors.	2	**To plan Extra hour**		TLM1/2	
No. of classes required to complete UNIT-II: 11				**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	HOD Sign Weekly
25.	Design procedures- adders,	1	To plan extra		TLM1/2	

	subtractors		hour			
26.	Serial adder/ subtractor	1	To plan extra hour		TLM1/2	
27.	Parallel adder/ subtractor	1	To plan extra hour		TLM1/2	
28.	Mid-I frm 02-10-2023 to 7-10-2023					
29.	Carry look ahead adder	1	11-10-2023		TLM1/2	
30.	BCD adder	1	13-10-2023		TLM1/2	
31.	Magnitude comparator	1	17-10-2023		TLM1/2	
32.	Decoder, Encoder	1	18-10-2023		TLM3	
33.	Tutorial-4	1	25-10-2023		TLM3	
34.	Multiplexer	1	27-10-2023		TLM1/2	
35.	Demultiplexer	1	28-10-2023			
36.	Parity generator/checker	1	31-10-2023		TLM1/2	
37.	Code converters	1	1-11-2023		TLM1/2	
38.	Memories-RAM, ROM,	1	3-11-2023		TLM1/2	
39.	PAL, PLA	1	4-11-2023		TLM1/2	
40.	Implementation of combinational logic using MUX, PROM	1	7-11-2023		TLM1/2	
41.	Tutorial-5	1	8-11-2023		TLM3	
42.	Implementation of combinational logic using PLA and PAL	1	10-11-2023		TLM1/2	
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	HOD Sign Weekly
43.	Latches, flipflops-JK,SR	1	14-11-2023, 15-11-2023		TLM1/2	
44.	Latches, flipflops-D,T	1	17-11-2023		TLM1/2	
45.	master-slave FF, characteristic equations and excitation tables	2	18-11-2023		TLM1/2	
46.	Tutorial-6	1	21-11-2023		TLM3	
47.	Modes of triggering-edge and level triggering	1	22-11-2023		TLM1/2	
48.	Realisation of one flip flop using other FFs	1	24-11-2023		TLM1/2	
49.	Registers and their operation-Synchronous and asynchronous counters	1	25-11-2023		TLM1/2	
50.	Modulo-n counter, race around condition	1	28-11-2023		TLM1/2	
No. of classes required to complete UNIT-IV: 9				No. of classes taken:		

UNIT-V: Asynchronous Sequential Circuits

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
51.	Sequence detector, FSM capabilities and limitations	1	29-11-2023		TLM1/2	
52.	Mealy and Moore models-Problems	1	1-12-2023		TLM1/2	
53.	Design of sequential circuits	1	2-12-2023		TLM1/2	
54.	Tutorial-7	1	To plan Extra hour		TLM3	
55.	Algorithmic state machines	1	To plan Extra hour		TLM1/2	
56.	Components of ASM chart	1	To plan Extra hour		TLM1/2	

57.	Salient features of ASM chart, ASM examples	1	To plan Extra hour		TLM1/2	
No. of classes required to complete UNIT-V: 7				No. of classes taken:		
Mid-II from 04-12-2023 to 09-12-2023						

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

PART-C

EVALUATION PROCESS (R20 Regulation)

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	D1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): D+Q+A	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs)

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs)

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

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	Dr.M.UmaVani	Dr.M.UmaVani	Dr. A V G A. Marthanda	Dr.J.S.V.Prasad
Signature				

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

COURSE HANDOUT

Part - A

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

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : **ELECTRIC AND MAGNETIC FIELDS (20EE07)**

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr.K.HARINATH REDDY**

COURSE COORDINATOR : **Dr.K.HARINATH REDDY**

Pre Requisite: Applied Mathematics-I, Engineering Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this course is to introduce the concepts of electric and magnetic fields and their applications which will be useful in the development of the theory for Electrical Machines and Power Systems.

COURSE OUTCOMES (COs)

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

CO1: Analyze static electric fields due to various charge distributions
CO2: Describe the boundary conditions for conductor and dielectric interfaces
CO3: Analyze static magnetic fields due to various current carrying elements
CO4: Apply Maxwell's equations to diverse engineering problems

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

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

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

BOS APPROVED TEXT BOOKS:

T1 William .H.Hayt, 'Engineering Electromagnetics', Tata McGraw Hill 7th edition.

T2 Gangadhar.K.A, "Field theory ", Khanna Publishers, New Delhi, 15th edition, 2004.

BOS APPROVED REFERENCE BOOKS:

R1: Mathew.N.O.Sadiku, "Elements of Electromagnetics",sixth edition,Oxford University Press,2015.

R2: David K Cheng,"Field and Wave Electromagnetics ", Pearson 2nd edition,2004.

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

UNIT-I: ELECTRO STATICS-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Course outcomes, Introduction to Coordinate systems	1	07-08-2023		TLM2	
2.	Coulomb's Law	1	09-08-2023		TLM2	
3.	Electric Field Intensity (EFI)	1	10-08-2023		TLM2	
4.	Electric Fields due to continuous charge distributions	1	14-08-2023		TLM2	
5.	EFI due to a line and a surface charge	1	16-08-2023		TLM2	
6.	**Tutorial-I**	1	17-08-2023		TLM2	
7.	Application of Guass's Law	1	19-08-2023		TLM2	
8.	Maxwell's first law	1	21-08-2023		TLM2	
9.	Electric Flux density, Gauss's law	1	23-08-2023		TLM2	
10.	**Tutorial-II problems**	1	24-08-2023		TLM2	
11.	**-Quiz-1/ Assignment-1**	1	26-08-2023		TLM2	
12.	Revision	1	28-08-2023			
No. of classes required to complete UNIT-I		12				

UNIT-II: ELECTRO STATICS-II

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Electric Potential – Properties of potential function – Potential gradient	1	30-08-23		TLM2	
14.	**Tutorial-III**	1	31-08-23		TLM2	
15.	Conductors, Dielectrics,current density & Equation of continuity .	1	02-09-23		TLM2	
16.	Ohm's law in point form & Behavior of conductors in an electric field	1	04-09-23		TLM2	

17.	Polarization,Displacement and Convection current, Electric field inside a dielectric material	1	06-09-23		TLM2	
18.	**Tutorial-IV**	1	07-09-23		TLM2	
19.	Work done in moving a point charge in an electrostatic field	1	09-09-23		TLM2	
20.	Electric dipole – Dipole moment , potential and EFI due to an electric dipole	1	11-09-23		TLM2	
21.	Conductor-Free space and Dielectric boundary conditions	1	13-09-23		TLM2	
22.	**Tutorial-V** &. Capacitance of parallel plate	1	14-09-23		TLM2	
23.	Capacitance calculation in static electric field	1	16-09-23		TLM2	
24.	Spherical co-axial capacitors with composite dielectrics	1	18-09-23		TLM2	
25.	Laplace's and Poison's equations and Solution of Laplace's equation in one variable	1	20-09-23		TLM2	
26.	**Quiz-2/ Assignment-2**	1	21-09-23		TLM2	
No. of classes required to complete UNIT-II		14				

UNIT-III: MAGNETO STATICS-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Static magnetic fields – Biot-Savart's law	1	23-09-23		TLM2	
28.	Magnetic field intensity (MFI) due to a straight current carrying filament	1	25-09-23		TLM2	
29.	MFI due to circular, square and solenoid current carrying wire	1	27-09-23		TLM2	
30.	**Tutorial-VI**	1	30-09-23		TLM2	
31.	**Mid-I**		04-10-23			
32.	**Mid-I**		05-10-23			
33.	**Mid-I**		07-10-23			

34.	MFI due to an infinite sheet of current and a long current carrying filament	1	09-10-23		TLM2	
35.	Relation between magnetic flux, magnetic flux density and MFI, Maxwell's second Equation	1	11-10-23		TLM2	
36.	Ampere's circuital law and its applications	1	12-10-23		TLM2	
37.	**Tutorial-VII**	1	14-10-23		TLM2	
38.	Point form of Ampere's circuital law	1	16-10-23		TLM2	
39.	Maxwell's third equation	1	18-10-23		TLM2	
40.	**Tutorial-VII /Quiz3/Assignment-3**	1	19-10-23		TLM2	
41.	Field due to a circular loop, rectangular and square loops	1	21-10-23		TLM2	
No. of classes required to complete UNIT-III		12				

UNIT-IV: MAGNETO STATICS-II

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Magnetic force - Moving charges in a Magnetic field	1	25-10-23		TLM1	
43.	Lorentz force equation – force on a current element	1	26-10-23		TLM1	
44.	Force on a straight and a long current carrying conductor	1	28-10-23		TLM1	
45.	Force between two straight long and parallel current carrying conductors	1	30-10-23		TLM1	
46.	Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole	1	01-11-23		TLM1	
47.	Torque on a current loop, magnetic potential, scalar magnetic potential and its limitations	1	02-11-23		TLM3 TLM1	

48.	Vector magnetic potential and its properties& vector Poisson's equations	1	04-11-23		TLM1	
49.	Vector magnetic potential due to simple configurations	2	06-11-23 08-11-23		TLM1	
50.	Neuman's formulae and Inductance calculation in static magnetic field	2	09-11-23		TLM1	
51.	**Tutorial-IX/QUIZ-4/ASSIGNMENT-4**	1	11-11-23		TLM6	
No. of classes required to complete UNIT-IV		12				

UNIT-V: ELECTRODYNAMIC FIELDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	Faraday's laws of electromagnetic induction	1	13-11-23		TLM1	
53.	Self and Mutual inductance & Statically and Dynamically induced EMFs	1	15-11-23		TLM1	
54.	Mutual inductance between a straight long wire in the same plan	1	16-11-23		TLM1	
55.	**TUTORIAL-X/QUIZ-5/ASSIGNMENT-5**	1	20-11-23		TLM6 TLM3	
56.	Maxwell's equations integral and point forms	2	22-11-23 23-11-23		TLM1	
57.	Modification of Maxwell's equations for time varying fields	1	25-11-23		TLM1	
58.	Poynting Theorem and Poynting vector **&** Determination of self-inductance of a solenoid and toroid	2	27-11-23 29-11-23		TLM1	
59.	**Beyond Syllabus:** Wave guide analysis, Wave propagations	1	30-11-22		TLM2	
60.	Revision	1	02-12-23			

61.	MID-II		3-3-2021			
62.	MID-II		4-3-2021			
63.	MID-II		9-3-2021			
64.	MID-II		10-3-2021			
No. of classes required to complete UNIT-V		11				

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)		

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	02-11-2010	16-01-2021	7W
I Mid Examinations	18-01-2021	23-01-2021	1W
II Phase of Instructions	25-01-2021	06-03-2021	9W
II Mid Examinations	03-03-2021	13-03-2021	1W
Preparation and Practicals	15-03-2021	23-03-2021	1 1/2W
Semester End Examinations	22-03-2021	03-03-2021	2W

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Dr.K.Harinath Reddy	Dr.Harinath Reddy	Dr.K.R.L.Prasad	Dr.J.Siva Vara Prasad
Course Instructor	Course Coordinator	Module Coordinator	H.O.D

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

COURSE HANDOUT

Part - A

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

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : **ELECTRIC AND MAGNETIC FIELDS (20EE07)**

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr.K.HARINATH REDDY**

COURSE COORDINATOR : **Dr.K.HARINATH REDDY**

Pre Requisite: Applied Mathematics-I, Engineering Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this course is to introduce the concepts of electric and magnetic fields and their applications which will be useful in the development of the theory for Electrical Machines and Power Systems.

COURSE OUTCOMES (COs)

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

CO1: Analyze static electric fields due to various charge distributions
CO2: Describe the boundary conditions for conductor and dielectric interfaces
CO3: Analyze static magnetic fields due to various current carrying elements
CO4: Apply Maxwell's equations to diverse engineering problems

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

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

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

BOS APPROVED TEXT BOOKS:

T1 William .H.Hayt, 'Engineering Electromagnetics', Tata McGraw Hill 7th edition.

T2 Gangadhar.K.A, "Field theory ", Khanna Publishers, New Delhi, 15th edition, 2004.

BOS APPROVED REFERENCE BOOKS:

R1: Mathew.N.O.Sadiku, "Elements of Electromagnetics",sixth edition,Oxford University Press,2015.

R2: David K Cheng,"Field and Wave Electromagnetics ", Pearson 2nd edition,2004.

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

UNIT-I: ELECTRO STATICS-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Course outcomes, Introduction to Coordinate systems	1	07-08-2023		TLM2	
2.	Coulomb's Law	1	08-08-2023		TLM2	
3.	Electric Field Intensity (EFI)	1	10-08-2023		TLM2	
4.	Electric Fields due to continuous charge distributions	1	11-08-2023		TLM2	
5.	EFI due to a line and a surface charge	1	14-08-2023		TLM2	
6.	**Tutorial-I**	1	17-08-2023		TLM2	
7.	Application of Guass's Law	1	18-08-2023		TLM2	
8.	Maxwell's first law	1	21-08-2023		TLM2	
9.	Electric Flux density, Gauss's law	1	22-08-2023		TLM2	
10.	**Tutorial-II problems**	1	24-08-2023		TLM2	
11.	**-Quiz-1/ Assignment-1**	1	25-08-2023		TLM2	
12.	Revision	1	28-08-2023			
No. of classes required to complete UNIT-I		12				

UNIT-II: ELECTRO STATICS-II

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Electric Potential – Properties of potential function – Potential gradient	1	29-08-23		TLM2	
14.	**Tutorial-III**	1	31-08-23		TLM2	
15.	Conductors, Dielectrics,current density & Equation of continuity .	1	01-09-23		TLM2	
16.	Ohm's law in point form & Behavior of conductors in an electric field	1	04-09-23		TLM2	

17.	Polarization,Displacement and Convection current, Electric field inside a dielectric material	1	05-09-23		TLM2	
18.	Work done in moving a point charge in an electrostatic field	1	08-09-23		TLM2	
19.	Electric dipole – Dipole moment , potential and EFI due to an electric dipole	1	11-09-23		TLM2	
20.	Conductor-Free space and Dielectric boundary conditions	1	12-09-23		TLM2	
21.	**Tutorial-IV** &. Capacitance of parallel plate	1	14-09-23		TLM2	
22.	Capacitance calculation in static electric field	1	15-09-23		TLM2	
23.	Spherical co-axial capacitors with composite dielectrics	1	18-09-23		TLM2	
24.	**Tutorial-V- Quiz-2/ Assignment-2**	1	21-09-23		TLM2	
No. of classes required to complete UNIT-II		12				

UNIT-III: MAGNETO STATICS-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Static magnetic fields – Biot-Savart's law	1	22-09-23		TLM2	
26.	Magnetic field intensity (MFI) due to a straight current carrying filament	1	25-09-23		TLM2	
27.	MFI due to circular, square and solenoid current carrying wire	1	26-09-23		TLM2	
28.	**Tutorial-VI**	1	29-09-23		TLM2	
29.	**Mid-I**		03-10-23			
30.	**Mid-I**		05-10-23			
31.	**Mid-I**		06-10-23			
32.	MFI due to an infinite sheet of current and a long current carrying filament	1	09-10-23		TLM2	

33.	Relation between magnetic flux, magnetic flux density and MFI, Maxwell's second Equation	1	10-10-23		TLM2	
34.	Ampere's circuital law and its applications	1	12-10-23		TLM2	
35.	**Tutorial-VII**	1	13-10-23		TLM2	
36.	Point form of Ampere's circuital law	1	16-10-23		TLM2	
37.	Maxwell's third equation	1	17-10-23		TLM2	
38.	**Tutorial-VIII /Quiz3/Assignment-3**	1	19-10-23		TLM2	
39.	Field due to a circular loop, rectangular and square loops	1	20-10-23		TLM2	
No. of classes required to complete UNIT-III		12				

UNIT-IV: MAGNETO STATICS-II

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Magnetic force -Moving charges in a Magnetic field	1	26-10-23		TLM1	
41.	Lorentz force equation – force on a current element	1	27-10-23		TLM1	
42.	Force on a straight and a long current carrying conductor	1	30-10-23		TLM1	
43.	Force between two straight long and parallel current carrying conductors	1	31-10-23		TLM1	
44.	Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole	1	02-11-23		TLM1	
45.	**Tutorial-IX &** Torque on a current loop, magnetic potential, scalar magnetic potential and its limitations	2	03-11-23 06-11-23		TLM3 TLM1	
46.	Vector magnetic potential and its properties& vector Poisson's equations	1	07-11-23		TLM1	
47.	Vector magnetic potential due to simple configurations	2	09-11-23 10-11-23		TLM1	

48.	Neuman's formulae and Inductance calculation in static magnetic field	2	13-11-23 14-11-23		TLM1	
49.	**Tutorial-X/QUIZ-4/ASSIGNMENT-4**	1	16-11-23		TLM6	
No. of classes required to complete UNIT-IV		13				

UNIT-V: ELECTRODYNAMIC FIELDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Faraday's laws of electromagnetic induction	1	17-11-23		TLM1	
51.	Self and Mutual inductance & Statically and Dynamically induced EMFs	1	20-11-23		TLM1	
52.	Mutual inductance between a straight long wire in the same plan	1	21-11-23		TLM1	
53.	**TUTORIAL-XI/QUIZ-5/ASSIGNMENT-5**	1	23-11-23		TLM6 TLM3	
54.	Maxwell's equations integral and point forms	2	24-11-23 27-11-23		TLM1	
55.	Modification of Maxwell's equations for time varying fields	1	28-11-23		TLM1	
56.	Poynting Theorem and Poynting vector **&** Determination of self-inductance of a solenoid and toroid	1	30-11-23 -		TLM1	
57.	**Beyond Syllabus:** Wave guide analysis, Wave propagations	1	01-12-23		TLM2	
58.	Revision	1	01-12-23			
59.	MID-II		04-12-23			
60.	MID-II		05-12-23			
61.	MID-II		07-12-23			
62.	MID-II		08-12-23			
No. of classes required to complete UNIT-V		10				

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)		

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	02-11-2010	16-01-2021	7W
I Mid Examinations	18-01-2021	23-01-2021	1W
II Phase of Instructions	25-01-2021	06-03-2021	9W
II Mid Examinations	03-03-2021	13-03-2021	1W
Preparation and Practicals	15-03-2021	23-03-2021	1 1/2W
Semester End Examinations	22-03-2021	03-03-2021	2W

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Dr.K.Harinath Reddy	Dr.Harinath Reddy	Dr.K.R.L.Prasad	Dr.J.Siva Vara Prasad
Course Instructor	Course Coordinator	Module Coordinator	H.O.D

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. V. Bhagya Lakshmi
Course Name & Code : Environmental Science & 20MC03
L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., EEE., III-Sem. SEC-A A.Y : 2023-24

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management.

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

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

TEXT BOOKS:

T1 Anubha Kaushik, C.P.Kaushik, "Perspectives in Environmental Studies", New age international publishers, 5th Edition, Delhi, 2016.

T2 Mahua Basu, S. Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 1st Edition, Delhi, 2016.

REFERENCE BOOKS:

R1 S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.

R2 R. Rajagopalan, "*Environmental Studies (From Crisis to Cure)*", Oxford University Press, 2nd Edition, New Delhi, 2012.

R3 De, A.K, "Environmental Chemistry", New Age International (P) Limited, 5th Edition, New Delhi, 2003.

R4 Dr.K.V.S.G. Murali Krishna, "Environmental Studies", VGS Techno Series, 1st Edition, Vijayawada, 2010.

R5 G. Tyler Miller, Scott Spoolman, "Introduction to Environmental Studies", Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction of course and course objectives. Introduction of components of Environment	1	07-08-2023		2	
2.	Population explosion and variations among Nations.	1	11-08-2023		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	14-08-2023		2	
4.	Environmental Hazards	1	18-08-2023		2	
5.	Role of Information Technology in environmental management and human health.	1	21-08-2023		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and classification of Natural resources, Forest Resources,	1	25-08-2023		2	
2.	Water Resources	1	28-08-2023		2	
3.	Mineral Resources	1	01-09-2023		2	
4.	Food Resources	1	04-09-2023		2	
5.	Food Resources	1	08-09-2023		2	
6.	Food Resources	1	11-09-2023		2	
7.	Energy Resources	1	15-09-2023		2	
No. of classes required to complete UNIT-II: 7				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, structure and functions of an ecosystem	1	18-09-2023		2	

2.	Food chains and Food webs, Ecological succession, Ecological pyramids,	1	22-09-2023		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of India. India as a mega diversity nation	1	25-09-2023		2	
4.	Bio-geo-chemical cycles	1	29-09-2023			
5.	**I MID EXAMINATION**	1	06-10-2023			
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	09-10-2023		2	
7.	Man and wild life conflicts. Endangered and endemic species of India	1	13-10-2023		2,3	
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	16-10-2023		2	
No. of classes required to complete UNIT-III: 7				No. of classes taken:		

UNIT-IV : ENVIRONMENTAL POLLUTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Air Pollution	1	20-10-2023		2	
2.	Causes, effects and control measures of: Water Pollution	1	27-10-2023		2	
3.	Causes, effects and control measures of: Soil Pollution,	1	30-10-2023			
4.	Noise Pollution		03-11-2023			
5.	Solid Waste Management	1	06-11-2023		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	10-11-2023		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL MANAGEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Sustainable Development	1	13-11-2023		2	
2.	Climate disruption-Greenhouse effect, ozone layer depletion and acid rain.	1	17-11-2023		2,3	
3.	Stockholm conference	1	20-11-2023		2	
4.	Environmental Impact Assessment (EIA)		24-11-2023		2	
5.	Green building	1	27-11-2023		2	
6.	Revision	1	01-12-2023		3	
7.	II MID EXAMINATIONS	1	04-12-2023		5	

8.	II MID EXAMINATIONS	1	08-12-2023		5	
No. of classes required to complete UNIT-V: 06				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. V. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. V. Bhagya Lakshmi
Course Name & Code : Environmental Science & 20MC03
L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., EEE., III-Sem. SEC-B A.Y : 2023-24

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management.

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

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

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

R1 S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.

R2 R. Rajagopalan, "*Environmental Studies (From Crisis to Cure)*", Oxford University Press, 2nd Edition, New Delhi, 2012.

R3 De, A.K, "Environmental Chemistry", New Age International (P) Limited, 5th Edition, New Delhi, 2003.

R4 Dr.K.V.S.G. Murali Krishna, "Environmental Studies", VGS Techno Series, 1st Edition, Vijayawada, 2010.

R5 G. Tyler Miller, Scott Spoolman, "Introduction to Environmental Studies", Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction of course and course objectives. Introduction of components of Environment	1	09-08-2023		2	
2.	Population explosion and variations among Nations.	1	11-08-2023		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	16-08-2023		2	
4.	Environmental Hazards	1	18-08-2023		2	
5.	Role of Information Technology in environmental management and human health.	1	23-08-2023		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and classification of Natural resources, Forest Resources,	1	25-08-2023		2	
2.	Water Resources	1	30-08-2023		2	
3.	Mineral Resources	1	01-09-2023		2	
4.	Food Resources	1	06-09-2023		2	
5.	Food Resources	1	08-09-2023		2	
6.	Food Resources	1	13-09-2023		2	
7.	Energy Resources	1	15-09-2023		2	
No. of classes required to complete UNIT-II: 7				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, structure and functions of an ecosystem	1	20-09-2023		2	

2.	Food chains and Food webs, Ecological succession, Ecological pyramids,	1	22-09-2023		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of India. India as a mega diversity nation	1	27-09-2023		2	
4.	Bio-geo-chemical cycles	1	29-09-2023			
5.	**I MID EXAMINATION**	1	04-10-2023			
6.	**I MID EXAMINATION**	1	06-10-2023			
7.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	11-10-2023		2	
8.	Man and wild life conflicts. Endangered and endemic species of India	1	13-10-2023		2,3	
9.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	18-10-2023		2	
No. of classes required to complete UNIT-III: 7				No. of classes taken:		

UNIT-IV : ENVIRONMENTAL POLLUTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Air Pollution	1	20-10-2023		2	
2.	Causes, effects and control measures of: Water Pollution	1	25-10-2023		2	
3.	Causes, effects and control measures of: Soil Pollution,	1	27-10-2023			
4.	Noise Pollution		01-11-2023			
5.	Solid Waste Management	1	03-11-2023		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	08-11-2023		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL MANAGEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Sustainable Development	1	10-11-2023		2	
2.	Climate disruption-Greenhouse effect, ozone layer depletion and acid rain.	1	15-11-2023		2,3	
3.	Stockholm conference	1	17-11-2023		2	
4.	Environmental Impact Assessment (EIA)		22-11-2023		2	
5.	Green building	1	24-11-2023		2	
6.	Revision	1	29-11-2023		3	

7.	Revision	1	01-12-2023			
8.	II MID EXAMINATIONS	1	06-12-2023		5	
9.	II MID EXAMINATIONS	1	08-12-2023		5	
No. of classes required to complete UNIT-V: 07				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. V. Bhagya Lakshmi	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : O.Venkata Siva / M.Swathi
Course Name & Code : DATA STRUCTURES LAB & 20CS53
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/III/A-Sec. **A.Y.:** 2023-24

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques
COURSE OUTCOMES (CO):
CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)
CO2: Implement Various Sorting Techniques. (**Apply - L3**)
CO3: : Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction & List using Arrays	3	08-08-2023 15-08-2023		
2.	Linked List Programs	9	22-08-2023, 29-08-2023 05-09-2023		
3.	Stack, Queue Using Arrays, Linked List	3	12-09-2023		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	19-09-2023		
5.	Circular Queue Double Ended Queue	3	26-09-2023		
6.	Bubble sort Selection sort Insertion sort	3	10-10-2023		
7.	Merge sort Quick sort	3	17-10-2023		
8.	Heap sort Binary Tree	3	24-10-2023		
9.	Binary Search Tree	3	31-10-2023 07-11-2023 14-11-2023		
10.	BFS,DFS	3	21-11-2023		
11.	Lab Internal Exam	3	28-11-2023		

PART-C

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. O.Venkata Siva**	**Dr.K. Naga Prasanthi**	**Dr. Y.Vijaya Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : M.Swathi/ O.Venkata Siva
Course Name & Code : DATA STRUCTURES LAB & 20CS53
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/III/B-Sec. **A.Y.:** 2023-24

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques
COURSE OUTCOMES (CO):
CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)
CO2: Implement Various Sorting Techniques. (**Apply - L3**)
CO3: : Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction & List using Arrays	3	10-08-2023		
2.	Linked List Programs	9	17-08-2023, 24-08-2023, 31-08-2023,		
3.	Stack, Queue Using Arrays, Linked List	3	07-09-2023,		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	14-09-2023,		
5.	Circular Queue Double Ended Queue	3	21-09-2023,		
6.	Bubble sort Selection sort Insertion sort	3	12-10-2023,		
7.	Merge sort Quick sort	3	19-10-2023,		
8.	Heap sort Binary Tree	3	26-10-2023,		
9.	Binary Search Tree	3	2-11-2023,		
10.	BFS, DFS	6	09-11-2023, 16-11-2023		
11.	Lab Internal Exam	3	30-11-2023,		

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Ms.M.Swathi**	**Mr D.Anil Kumar**	**Dr. Y.Vijaya Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor **:** Dr.M.S.Giridhar / Dr.A.V.G.A.Marthanda / Mr.J.V.Pavan Chand
Course Name & Code **:** ELECTRICAL MACHINES-II LAB & 20EE59
L-T-P Structure **: 0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/A **A.Y.:** 2023-24

PRE-REQUISITES **: Fundamentals of Electrical Engineering**

COURSE EDUCATIONAL OBJECTIVES (CEOs):
The objective of this lab is to impart hands on experience in verification of circuit laws and theorems, study of circuit characteristics and simulation of time response. It also gives practical exposure to the usage of CRO, power sources and function generator.

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

CO1	Examine the response of AC and DC electric circuits using theorems **(Apply-L3)**
CO2	Analyze the magnetic circuits **(Understand-L2)**
CO3	Design resonance circuits **(Apply-L3)**
CO4	Estimate two port network parameters **(Apply-L3)**
CO5	Analyze the electrical circuit using simulation tools **(Apply-L3)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2		2				2	2	2				2		
CO2	3	2		2				2	2	2				2		
CO3	3	2		2				2	2	2				2	2	
CO4	3	2		2	2			2	2	2				2	2	
CO5	3	2		2	2			2	2	2				2		
1 - Low					**2** –Medium						**3** - High					

Part - B

COURSE DELIVERY PLAN (LESSON PLAN):

SECTION-A SCHEDULE

DAY : THURSDAY

Batches : 22761A0201-232

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
	Tentative date														
	Actual date														
B-1	**21761A0245, 22761A201-203**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**22761A0204-206**	**DEMO**	2	3	4	5	1	2	3	4	5	1			
B-3	**22761A0207-209**	**DEMO**	3	4	5	1	2	3	4	5	1	2			
B-4	**22761A0210-212**	**DEMO**	4	5	1	2	3	4	5	1	2	3			
B-5	**22761A0213-216**	**DEMO**	5	1	2	3	4	5	1	2	3	4			
B-6	**22761A0217-219**	**DEMO**	6	7	8	9	10	6	7	8	9	10			
B-7	**22761A0220-222**	**DEMO**	7	8	9	10	6	7	8	9	10	6			
B-8	**22761A0223-225**	**DEMO**	8	9	10	6	7	8	9	10	6	7			
B-9	**22761A0226-228**	**DEMO**	9	10	6	7	8	9	10	6	7	8			
B-10	**22761A0229-232**	**DEMO**	10	6	7	8	9	10	6	7	8	9			

DAY : SATURDAY

Batches : 21761A0233 – 255, LE-1,2,3,4,5,6,7

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date													
	Actual date													
B-1	**22761A0233-235**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**22761A0236-238**	**DEMO**	2	3	4	5	1	2	3	4	5	1		
B-3	**22761A0239-240**	**DEMO**	3	4	5	1	2	3	4	5	1	2		
B-4	**22761A0242-244**	**DEMO**	4	5	1	2	3	4	5	1	2	3		
B-5	**22761A0245-247**	**DEMO**	5	1	2	3	4	5	1	2	3	4		
B-6	**22761A0248-250**	**DEMO**	6	7	8	9	10	6	7	8	9	10		
B-7	**22761A0251-253**	**DEMO**	7	8	9	10	6	7	8	9	10	6		
B-8	**22761A0254-255, LE-1**	**DEMO**	8	9	10	6	7	8	9	10	6	7		
B-9	**LE-2,3,4**	**DEMO**	9	10	6	7	8	9	10	6	7	8		
B-10	**LE-5,6,7**	**DEMO**	10	6	7	8	9	10	6	7	8	9		

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Dr.M.S.Giridhar / Dr.A.V.G.A.Marthanda / Mr.J.V.Pavan Chand	Dr.M.S.Giridhar		Dr.J.SIVAVARA PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.P.Deepak Reddy / Dr.G.Nageswara Rao / Mrs.T.Hima Bindu
Course Name & Code : ELECTRICAL CIRCUITS & SIMULATION LAB &20EE54
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/B **A.Y.:** 2023-24

PRE-REQUISITES : **Fundamentals of Electrical Engineering**

COURSE EDUCATIONAL OBJECTIVES (CEOs):
The objective of this lab is to impart hands on experience in verification of circuit laws and theorems, study of circuit characteristics and simulation of time response. It also gives practical exposure to the usage of CRO, power sources and function generator.

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

CO1	Examine the response of AC and DC electric circuits using theorems **(Apply-L3)**
CO2	Analyze the magnetic circuits **(Understand-L2)**
CO3	Design resonance circuits **(Apply-L3)**
CO4	Estimate two port network parameters **(Apply-L3)**
CO5	Analyze the electrical circuit using simulation tools **(Apply-L3)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2		2				2	2	2				2		
CO2	3	2		2				2	2	2				2		
CO3	3	2		2				2	2	2				2	2	
CO4	3	2		2	2			2	2	2				2	2	
CO5	3	2		2	2			2	2	2				2		
1 - Low						**2** –Medium						**3 -** High				

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

DAY : TUESDAY
Batches : 22761A0256-286

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
	Tentative date														
	Actual date														
B-1	**21761A0256 -258**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**22761A0259-261**	**DEMO**	2	3	4	5	1	2	3	4	5	1			
B-3	**22761A0262-264**	**DEMO**	3	4	5	1	2	3	4	5	1	2			
B-4	**22761A0265-267**	**DEMO**	4	5	1	2	3	4	5	1	2	3			
B-5	**22761A0268-270**	**DEMO**	5	1	2	3	4	5	1	2	3	4			
B-6	**22761A0271-273**	**DEMO**	6	7	8	9	10	6	7	8	9	10			
B-7	**22761A0274-276**	**DEMO**	7	8	9	10	6	7	8	9	10	6			
B-8	**22761A0277-279**	**DEMO**	8	9	10	6	7	8	9	10	6	7			
B-9	**22761A0280-282**	**DEMO**	9	10	6	7	8	9	10	6	7	8			
B-10	**22761A0283-286**	**DEMO**	10	6	7	8	9	10	6	7	8	9			

DAY : WEDNESDAY

Batches : 21761A0287 – 2A9

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date													
	Actual date													
B-1	**22761A0287-289**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**22761A0290-292**	**DEMO**	2	3	4	5	1	2	3	4	5	1		
B-3	**22761A0293-295**	**DEMO**	3	4	5	1	2	3	4	5	1	2		
B-4	**22761A0296-299**	**DEMO**	4	5	1	2	3	4	5	1	2	3		
B-5	**22761A02A0-2A3**	**DEMO**	5	1	2	3	4	5	1	2	3	4		
B-6	**22761A02A4-2A6**	**DEMO**	6	7	8	9	10	6	7	8	9	10		
B-7	**22761A02A7-2A9**	**DEMO**	7	8	9	10	6	7	8	9	10	6		
B-8		**DEMO**	8	9	10	6	7	8	9	10	6	7		
B-9		**DEMO**	9	10	6	7	8	9	10	6	7	8		
B-10		**DEMO**	10	6	7	8	9	10	6	7	8	9		

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Mr.P.Deepak Reddy / Dr.G.Nageswara Rao / Mrs.T.Hima Bindu	Mr.P.Deepak Reddy	Dr.P.Sobha Rani	Dr.J.SIVAVARA PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF EEE

COURSE HANDOUT
BATCH-II

Name of Course Instructor(s): 1.Dr. M. Uma Vani, 2.Mr.R.Anjaneyulu Naik
Course Name & Code : Digital Electronics Lab (20EE55)
L-T-P Structure : 0-0-2 **Credits:** 2
Program/Sem/Sec : B.Tech/III/A **A.Y.: 2023-24**
PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVE (CEO): This laboratory course enables the students to demonstrate the design and application of digital logic circuits in day-to-day life.

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

CO1	Analyze simple combinational and sequential logic circuits **(Understand-L2)**
CO2	Demonstrate different applications of ICs **(Apply-L3)**
CO3	Design the logic circuits using simulation tools **(Apply-L3)**

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

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

Lesson Plan:

S. No.	List of Experiments	No. of Lab Slots Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	DE Lab Demonstration	1	10-8-2023		TLM 1/4/5	
2.	Logic gates function verification using truth tables (basic, universal, and special gates)	1	17-8-2023		TLM4/5	
3.	Realization of AND,OR, XOR,NOT gates using universal gates and its functional verification.	1	24-8-2023		TLM4/5	
4.	Design a Half adder and Full adder circuits and verify their functionality.	1	31-8-2023		TLM4/5	
5.	**Design a 4-bit comparator and verify its functionality using IC 7485.**	**1**	**7-9-2023**		TLM4/5	
6.	**Design a 4-Bit binary-to Gray code converter and verify its functionality using logic gates.**	**1**	14-9-2023		TLM4/5	
7.	Design and verify the functionality of Decoders with different inputs.	1	21-9-2023		TLM4/5	
8.	Verify the functionality of the following Flipflops-SR-JK-D-T.	1	28-9-2023		TLM4/5	
9.	Design and verify the functionality of Multiplexers with different inputs.	1	12-10-2023		TLM4/5	
10.	Design and verify BCD-to-Seven segment decoder using simulation tools.	1	19-10-2023		TLM4/5	
11.	Design and verify UP-Counter with JK-FFs using simulation tools	1	26-10-2023		TLM4/5	
12.	Design and verify 4-bit Asynchronous counter with JK-FF using simulation tools.	1	2-11-2023		TLM4/5	
13.	**Repetition class**	**1**	9-11-2023		TLM4/5	
14.	**Internal Lab Exam**	1	16-11-2023		TLM4/5	
15.	**Revision class**	**1**	23-11-2023		TLM4/5	
16.	**Revision class**	**1**	30-11-2023		TLM4/5	
No. of lab slots required to complete 11 experiments: 12 (Including Demo class)				**No. of lab slots taken:**		

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	1.Dr. M. Uma Vani, 2.Mr.R.Anjaneyulu Naik	Dr.M.UmaVani		Dr.J.S.V.Prasad
Signatures	**1.** **2.**			

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DEPARTMENT OF EEE

COURSE HANDOUT
BATCH-I

Name of Course Instructor(s): 1.Dr. M. Uma Vani, 2.Mr.R.Anjaneyulu Naik
Course Name & Code **:** Digital Electronics Lab (20EE55)
L-T-P Structure **:** 0-0-2 **Credits:** 2
Program/Sem/Sec : B.Tech/III/A **A.Y.: 2023-24**
PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVE (CEO): This laboratory course enables the students to demonstrate the design and application of digital logic circuits in day-to-day life.

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

CO1	Analyze simple combinational and sequential logic circuits **(Understand-L2)**
CO2	Demonstrate different applications of ICs **(Apply-L3)**
CO3	Design the logic circuits using simulation tools **(Apply-L3)**

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

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

Lesson Plan:

S. No.	List of Experiments	No. of Lab Slots Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	DE Lab Demonstration	1	11-8-2023		TLM 1/4/5	
2.	Logic gates function verification using truth tables (basic, universal, and special gates)	1	18-8-2023		TLM4/5	
3.	Realization of AND,OR, XOR,NOT gates using universal gates and its functional verification.	1	25-8-2023		TLM4/5	
4.	Design a Half adder and Full adder circuits and verify their functionality.	1	1-9-2023		TLM4/5	
5.	**Design a 4-bit comparator and verify its functionality using IC 7485.**	**1**	8-9-2023		TLM4/5	
6.	**Design a 4-Bit binary-to Gray code converter and verify its functionality using logic gates.**	**1**	15-9-2023		TLM4/5	
7.	Design and verify the functionality of Decoders with different inputs.	1	22-9-2023		TLM4/5	
8.	Verify the functionality of the following Flipflops-SR-JK-D-T.	1	29-9-2023		TLM4/5	
9.	Design and verify the functionality of Multiplexers with different inputs.	1	13-10-2023		TLM4/5	
10.	Design and verify BCD-to-Seven segment decoder using simulation tools.	1	27-10-2023		TLM4/5	
11.	Design and verify UP-Counter with JK-FFs using simulation tools	1	3-11-2023		TLM4/5	
12.	Design and verify 4-bit Asynchronous counter with JK-FF using simulation tools.	1	10-11-2023		TLM4/5	
13.	**Repetition class**	**1**	17-11-2023		TLM4/5	
14.	**Internal Lab Exam**	1	24-11-2023		TLM4/5	
15.	**Revision class**	**1**	1-12-2023		TLM4/5	
No. of lab slots required to complete 11 experiments: 12 (Including Demo class)				**No. of lab slots taken:**		

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	1.Dr. M. Uma Vani, 2.Mr.R.Anjaneyulu Naik	Dr.M.UmaVani		Dr.J.S.V.Prasad
Signatures	**1.** **2.**			

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.A.V.RAVIKUMAR/Mr.K.NAGALINGA CHARY/Mr.V.PRABHAKAR REDDY
Course Name & Code : DIGITAL ELECTRONICS LAB & 20EE55
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/B **A.Y.:** 2023-24
PRE-REQUISITES : Digital Electronics
COURSE EDUCATIONAL OBJECTIVES (CEOs): This laboratory course enables the students to demonstrate the design and application of digital logic circuits in day-to-day life.

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

CO1	Analyze simple combinational and sequential logic circuits (Understand-L2)
CO2	Demonstrate different application of ICs (Apply-L3)
CO3	Design the logic circuits using simulation tools (Apply-L3)

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

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

TEXTBOOKS:

T1 Morris Mano, Michael D. Ciletti ,"Digital Design with an Introduction to the Verilog HDL", Pearson Education, New Jersey, 5th edition, 2013.

T2 Zvi Kohavi, Niraj K. Jha, "Switching and Finite Automata Theory", Cambridge University Press, New York, 3rd edition, 2010.

REFERENCE BOOKS:

R1: John F. Wakerly, "Digital Design", Pearson Education ,New Delhi, 4th edition,2014.

R2: A. Anand Kumar, "Switching Theory and Logic Design", PHI Publishers,New Delhi,3rd edition, 2016

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

DAY : TUESDAY
Batches : 22761A0287 TO 2A9, LE'S

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date	08/08	22/08	29/08	05/09	12/09	26/09	10/10	17/10	31/10	07/11	14/11	21/11	28/11
	Actual date													
B-1	22761A0287 22761A0288	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	22761A0289 22761A0290	DEMO	1	2	3	4	5	6	7	8	9	10		
B-3	22761A0291 22761A0292	DEMO	1	2	3	4	5	6	7	8	9	10		
B-4	22761A0293 22761A0294	DEMO	1	2	3	4	5	6	7	8	9	10		
B-5	22761A0295 22761A0296	DEMO	1	2	3	4	5	6	7	8	9	10		
B-6	22761A0297 22761A0299	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	22761A02A0 22761A02A1	DEMO	1	2	3	4	5	6	7	8	9	10		
B-8	22761A02A2 22761A02A3	DEMO	1	2	3	4	5	6	7	8	9	10		
B-9	22761A02A4 22761A02A5 22761A02A6	DEMO	1	2	3	4	5	6	7	8	9	10		
B-10	22761A02A7 22761A02A8 22761A02A9	DEMO	1	2	3	4	5	6	7	8	9	10		

DAY : WEDNESDAY

Batches : 20761A0281, 22761A0256 To 286

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week	XVI Week
	Tentative date	09/08	16/08	23/08	30/08	06/09	13/09	20/09	27/09	11/10	18/10	25/10	01/11	08/11	15/11	22/11	29/11
	Actual date																
B-1	20761A0281 22761A0256 22761A0257 22761A0258	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	22761A0259 22761A0260 22761A0261 22761A0262	DEMO	1	2	3	4	5	6	7	8	9	10					
B-3	22761A0263 22761A0264 22761A0265	DEMO	1	2	3	4	5	6	7	8	9	10					
B-4	22761A0266 22761A0267 22761A0268	DEMO	1	2	3	4	5	6	7	8	9	10					
B-5	22761A0269 22761A0270 22761A0271	DEMO	1	2	3	4	5	6	7	8	9	10					
B-6	22761A0272 22761A0273 22761A0274	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	22761A0275 22761A0276 22761A0277	DEMO	1	2	3	4	5	6	7	8	9	10					
B-8	22761A0278 22761A0279 22761A0280	DEMO	1	2	3	4	5	6	7	8	9	10					
B-9	22761A0281 22761A0282 22761A0283	DEMO	1	2	3	4	5	6	7	8	9	10					
B-10	22761A0284 22761A0285 22761A0286	DEMO	1	2	3	4	5	6	7	8	9	10					

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.A.V.RAVIKUMAR/Mr.K.NAGALINGA CHARY/Mr.V.PRABHAKAR REDDY
Course Name & Code : DIGITAL ELECTRONICS LAB & 20EE55
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/B **A.Y.:** 2023-24
PRE-REQUISITES : Digital Electronics
COURSE EDUCATIONAL OBJECTIVES (CEOs): This laboratory course enables the students to demonstrate the design and application of digital logic circuits in day-to-day life.

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

CO1	Analyze simple combinational and sequential logic circuits (Understand-L2)
CO2	Demonstrate different application of ICs (Apply-L3)
CO3	Design the logic circuits using simulation tools (Apply-L3)

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

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

TEXTBOOKS:

T1 Morris Mano, Michael D. Ciletti ,"Digital Design with an Introduction to the Verilog HDL", Pearson Education, New Jersey, 5th edition, 2013.

T2 Zvi Kohavi, Niraj K. Jha, "Switching and Finite Automata Theory", Cambridge University Press, New York, 3rd edition, 2010.

REFERENCE BOOKS:

R1: John F. Wakerly, "Digital Design", Pearson Education ,New Delhi, 4th edition,2014.

R2: A. Anand Kumar, "Switching Theory and Logic Design", PHI Publishers,New Delhi,3rd edition, 2016

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

DAY : TUESDAY
Batches : 22761A0287 TO 2A9, LE'S

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date	08/08	22/08	29/08	05/09	12/09	26/09	10/10	17/10	31/10	07/11	14/11	21/11	28/11
	Actual date													
B-1	22761A0287 22761A0288	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	22761A0289 22761A0290	DEMO	1	2	3	4	5	6	7	8	9	10		
B-3	22761A0291 22761A0292	DEMO	1	2	3	4	5	6	7	8	9	10		
B-4	22761A0293 22761A0294	DEMO	1	2	3	4	5	6	7	8	9	10		
B-5	22761A0295 22761A0296	DEMO	1	2	3	4	5	6	7	8	9	10		
B-6	22761A0297 22761A0299	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	22761A02A0 22761A02A1	DEMO	1	2	3	4	5	6	7	8	9	10		
B-8	22761A02A2 22761A02A3	DEMO	1	2	3	4	5	6	7	8	9	10		
B-9	22761A02A4 22761A02A5 22761A02A6	DEMO	1	2	3	4	5	6	7	8	9	10		
B-10	22761A02A7 22761A02A8 22761A02A9	DEMO	1	2	3	4	5	6	7	8	9	10		

DAY : WEDNESDAY

Batches : 20761A0281, 22761A0256 To 286

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week	XVI Week
	Tentative date	09/08	16/08	23/08	30/08	06/09	13/09	20/09	27/09	11/10	18/10	25/10	01/11	08/11	15/11	22/11	29/11
	Actual date																
B-1	20761A0281 22761A0256 22761A0257 22761A0258	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	22761A0259 22761A0260 22761A0261 22761A0262	DEMO	1	2	3	4	5	6	7	8	9	10					
B-3	22761A0263 22761A0264 22761A0265	DEMO	1	2	3	4	5	6	7	8	9	10					
B-4	22761A0266 22761A0267 22761A0268	DEMO	1	2	3	4	5	6	7	8	9	10					
B-5	22761A0269 22761A0270 22761A0271	DEMO	1	2	3	4	5	6	7	8	9	10					
B-6	22761A0272 22761A0273 22761A0274	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	22761A0275 22761A0276 22761A0277	DEMO	1	2	3	4	5	6	7	8	9	10					
B-8	22761A0278 22761A0279 22761A0280	DEMO	1	2	3	4	5	6	7	8	9	10					
B-9	22761A0281 22761A0282 22761A0283	DEMO	1	2	3	4	5	6	7	8	9	10					
B-10	22761A0284 22761A0285 22761A0286	DEMO	1	2	3	4	5	6	7	8	9	10					

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

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