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 EEE

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. K. BHANU LAKSHMI
Course Name & Code **:** Numerical Methods & Integral Calculs&20FE10
L-T-P Structure **:** 2-1 -0 **Credits:3**
Program/Sem/Sec : II B.Tech/III sem/A **A.Y.:** 2022 - 23

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.

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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	12/09/22		TLM1	
2.	Introduction to UNIT I	1	13/09/22		TLM2	
3.	Forward Differences	1	16/09/22		TLM1	
4.	Backward differences	1	17/09/22		TLM1	
5.	Central Differences	1	19/09/22		TLM1	
6.	Symbolic relations and separation of symbols	1	20/09/22		TLM1	
7.	Symbolic relations and separation of symbols	1	23/09/22		TLM1	
8.	Newton's forward formulae for interpolation	1	24/09/22		TLM1	
9.	Newton's backward formulae for interpolation	1	26/09/22		TLM1	
10.	Related Problems	1	27/09/22			
11.	Lagrange's Interpolation	1	30/09/22		TLM1	
12.	TUTORIAL I	1	01/10/22		TLM1	
13.	Lagrange's Interpolation	1	07/10/22		TLM3	
No. of classes required to complete UNIT-I: 13				**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
14.	Introduction to UNIT II	1	08/10/22		TLM2	
15.	Algebraic and Transcendental Equations	1	10/10/22		TLM1	
16.	False Position method	1	11/10/22		TLM1	
17.	False Position method	1	14/10/22		TLM1	
18.	Newton- Raphson Method in one variable	1	15/10/22		TLM1	
19.	Newton- Raphson Method applications	1	17/10/22		TLM1	
20.	Tutorial II	1	18/10/22		TLM3	
21.	Related Problems		21/10/22			
22.	Trapezoidal rule	1	22/10/22		TLM1	
23.	Simpson's 1/3 Rule, Simpson's 3/8 Rule	1	25/10/22		TLM1	
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
24.	Introduction to Unit-III	1	28/10/22		TLM2	

25.	Double Integrals -Cartesian coordinates	1	29/10/22		TLM1	
26.	Applications to Double integrals (Content Beyond the syllabus)	1	31/10/22		TLM2	
27.	Triple Integrals - Cartesian coordinates	1	01/11/22		TLM1	
28.	Triple Integrals - Polar coordinates	1	04/11/22		TLM1	
29.	TUTORIAL - III	1	05/11/22		TLM3	
30.	Triple Integrals - Spherical coordinates	1	14/11/22		TLM 1	
31.	Change of order of Integration	1	15/11/22		TLM1	
32.	Change of order of Integration	1	18/11/22		TLM1	
33.	Change of order of Integration	1	19/11/22		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	21/11/22		TLM1	
35.	Determination of Fourier coefficients, Even and Odd Functions	1	22/11/22		TLM1	
36.	Fourier Series in the [0,2pi]	1	25/11/22		TLM1	
37.	Fourier Series in the [0,2pi]	1	26/11/22		TLM1	
38.	Fourier Series in an arbitrary interval	1	28/11/22		TLM1	
39.	Problems	1	29/11/22		TLM1	
40.	Fourier Series in an arbitrary interval	1	02/12/22		TLM1	
41.	TUTORIAL IV	1	03/12/22		TLM3	
42.	Fourier series in an arbitrary interval odd and even functions		05/12/22		TLM1	
43.	Half-range Sine and Cosine series	1	06/12/22		TLM1	
44.	Half-range Sine and Cosine series	1	09/12/22		TLM1	
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	12/12/22		TLM1	
46.	Vector Differentiation	1	13/12/22		TLM1	
47.	Gradient	1	16/12/22		TLM1	
48.	Directional Derivative	1	17/12/22		TLM1	
49.	Directional Derivative	1	19/12/22		TLM1	
50.	Divergence	1	20/12/22		TLM3	
51.	Curl	1	23/12/22		TLM1	
52.	TUTORIAL V	1	24/12/22		TLM1	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	26/12/22		TLM1	
54.	Laplacian, second order operators	1	27/12/22		TLM 1	
55.	Properties	1	30/12/22		TLM1	
56.	Content beyond the syllabus		31/12/22			
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (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. K. Bhanu Lakshmi**	**Dr. K. R. Kavitha**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: G.VIJAYA LAKSHMI

Course Name & Code : Numerical Methods & Integral Calculs&20FE10
L-T-P Structure : 2-1 -0 **Credits:3**
Program/Sem/Sec : II B.Tech/III sem/EEE-B **A.Y.:** 2022 - 23

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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	12/09/22		TLM1	
2.	Introduction to UNIT I	1	13/09/22		TLM2	
3.	Forward Differences	1	14/09/22		TLM1	
4.	Backward differences	1	16/09/22		TLM1	
5.	Central Differences	1	19/09/22		TLM1	
6.	Symbolic relations and separation of symbols	1	20/09/22		TLM1	
7.	Symbolic relations and separation of symbols	1	21/09/22		TLM1	
8.	Newton's forward formulae for interpolation	1	23/09/22		TLM1	
9.	Newton's backward formulae for interpolation	1	26/09/22		TLM1	
10.	Related Problems	1	27/09/22		TLM1	
11.	Lagrange's Interpolation	1	28/09/22		TLM1	
12.	TUTORIAL I	1	30/09/22		TLM1	
13.	Lagrange's Interpolation	1	10/10/22		TLM3	
No. of classes required to complete UNIT-I: 13				**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
14.	Introduction to UNIT II	1	11/10/22		TLM2	
15.	Algebraic and Transcendental Equations	1	12/10/22		TLM1	
16.	False Position method	1	14/10/22		TLM1	
17.	False Position method	1	17/10/22		TLM1	
18.	Newton- Raphson Method in one variable	1	18/10/22		TLM1	
19.	Newton- Raphson Method applications	1	19/10/22		TLM1	
20.	Tutorial II	1	21/10/22		TLM3	
21.	Related Problems	1	25/10/22		TLM1	
22.	Trapezoidal rule	1	26/10/22		TLM1	
23.	Simpson's 1/3 Rule, Simpson's 3/8 Rule	1	28/10/22		TLM1	
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
24.	Introduction to Unit-III	1	31/10/22		TLM2	
25.	Double Integrals -Cartesian coordinates	1	01/11/22		TLM1	
26.	Applications to Double integrals	1	02/11/22		TLM2	

	(Content Beyond the syllabus)					
27.	Triple Integrals - Cartesian coordinates	1	04/11/22		TLM1	
28.	Triple Integrals - Polar coordinates	1	14/11/22		TLM1	
29.	TUTORIAL - III	1	15/11/22		TLM3	
30.	Triple Integrals - Spherical coordinates	1	16/11/22		TLM 1	
31.	Change of order of Integration	1	18/11/22		TLM1	
32.	Change of order of Integration	1	21/11/22		TLM1	
33.	Change of order of Integration	1	22/11/22		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	23/11/22		TLM1	
35.	Determination of Fourier coefficients, Even and Odd Functions	1	25/11/22		TLM1	
36.	Fourier Series in the [0,2pi]	1	28/11/22		TLM1	
37.	Fourier Series in the [0,2pi]	1	29/11/22		TLM1	
38.	Fourier Series in an arbitrary interval	1	30/11/22		TLM1	
39.	Problems	1	02/12/22		TLM1	
40.	Fourier Series in an arbitrary interval	1	05/12/22		TLM1	
41.	TUTORIAL IV	1	06/12/22		TLM3	
42.	Fourier series in an arbitrary interval odd and even functions	1	07/12/22		TLM1	
43.	Half-range Sine and Cosine series	1	09/12/22		TLM1	
44.	Half-range Sine and Cosine series	1	12/12/22		TLM1	
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	13/12/22		TLM1	
46.	Vector Differentiation	1	14/12/22		TLM1	
47.	Gradient	1	16/12/22		TLM1	
48.	Directional Derivative	1	19/12/22		TLM1	
49.	Directional Derivative	1	20/12/22		TLM1	
50.	Divergence	1	21/12/22		TLM3	
51.	Curl	1	23/12/22		TLM1	
52.	TUTORIAL V	1	26/12/22		TLM1	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	27/12/22		TLM1	
54.	Laplacian, second order operators	1	28/12/22		TLM 1	
55.	Properties	1	30/12/22		TLM1	
56.	Content beyond the syllabus		30/12/22			
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	**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 : Mr. Lella Kranthi Kumar
Course Name & Code : Data Structures & 20CS03
L-T-P Structure : 3 – 0 – 0 **Credits:** 03
Programme/Sem./Sec. : B.Tech. /III/A-sec **A.Y. :** 2022-23

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, the student will be able to

CO1	Write the algorithms for various operations on lists using arrays and linked lists 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	13-09-2022		TLM1	
2.	Classification of Data Structures	1	14-09-2022		TLM1	
3.	Introduction to Algorithm	1	16-09-2022		TLM1	
4.	Algorithm Analysis	1	17-09-2022		TLM1	
5.	Asymptotic Notations	1	20-09-2022		TLM1	
6.	List using Arrays	1	21-09-2022		TLM1	
7.	Single Linked List	3	23-09-2022, 24-09-2022, 27-09-2022		TLM1	
8.	Double Linked List	3	28-09-2022, 30-09-2022, 01-10-2022		TLM1	
9.	Circular Linked List	2	11-10-2022, 12-10-2022		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	14-10-2022		TLM2	
11.	STACKS USING ARRAYS	1	15-10-2022		TLM1	
12.	STACKS USING LINKED LIST	1	18-10-2022		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	19-10-2022 & 21-10-2022		TLM1	
14.	POSTFIX EVALUTION	1	22-10-2022		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	25-10-2022		TLM1	
16.	QUEUE	1	26-10-2022		TLM1	
17.	QUEUE USING ARRAY	1	28-10-2022		TLM1	
18.	QUEUE USING LINKED LIST	1	29-10-2022		TLM1	
19.	CIRCULAR QUEUE	1	01-11-2022		TLM1	
20.	DEQUE	1	02-11-2022		TLM1	
No. of classes required to complete UNIT-II: 12				**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	04-11-2022		TLM2	
22.	Insertion Sort	1	05-11-2022		TLM1	
23.	Selection Sort	1	15-11-2022		TLM1	
24.	Merge Sort	2	16-11-2022 & 18-11-2022		TLM1	
25.	Quick Sort	2	19-11-2022 & 22-11-2022		TLM1	
26.	Heap Sort	2	23-11-2022 & 25-11-2022		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	26-11-2022		TLM1	
28.	Tree Traversals	2	29-11-2022, 30-11-2022		TLM1	
29.	Binary Trees	1	02-12-2022		TLM2	
30.	Binary Search Trees	2	03-12-2022, 06-12-2022		TLM1	
31.	AVL Trees	2	07-12-2022, 09-12-2022		TLM1	
32.	Operations	2	10-12-2022, 13-12-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				**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	14-12-2022		TLM1	
34.	REPRESENTATION OF GRAPHS	1	16-12-2022		TLM1	
35.	BFS	2	17-12-2022, 20-12-2022		TLM1	
36.	DFS	2	23-12-2022, 24-12-2022		TLM1	
37.	Hashing Introduction, Hash function, separate Chaining	2	27-12-2022, 28-12-2022		TLM1	
38.	Linear & Quadratic Probing	2	30-12-2022, 31-12-2022		TLM1	
39.	Double & Rehasing	2	03-01-2023, 04-01-2023		TLM2	
40.	Real-Time Applications of Data Structures	2	06-01-2023, 07-01-2023		TLM2	
No. of classes required to complete UNIT-V: 14				**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=05
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=25
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=05
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=25
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=40
Cumulative Internal Examination (CIE): M	40
Semester End Examination (SEE)	60
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. Lella Kranthi Kumar**	**Ms. P. Sarala**	**Dr. K. N. Prashanthi**	**Dr. D. Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : JAGADEESWARA RAO P
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.:** 2022-23

PREREQUISITE: C 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: Algorithm analysis, Introduction to Arrays, Lists

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	12-09-2022		TLM1	
2.	Classification of Data Structures	1	13-09-2022		TLM1	
3.	Introduction to Algorithm	1	14-09-2022		TLM1	
4.	Algorithm Analysis	1	15-09-2022		TLM1	
5.	Asymptotic Notations	1	19-09-2022		TLM1	
6.	List using Arrays	1	20-09-2022		TLM1	
7.	Single Linked List	3	21-09-2022 22-09-2022 26-09-2022		TLM1	
8.	Double Linked List	3	27-09-2022 28-09-2022 29-09-2022		TLM1	
9.	Circular Linked List	2	10-10-2022 11-10-2022		TLM1	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II: Stacks and Queues

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	12-10-2022		TLM2	
11.	STACKS USING ARRAYS	1	13-10-2022		TLM1	
12.	STACKS USING LINKED LIST	1	17-10-2022		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	18-10-2022		TLM1	
14.	POSTFIX EVALUTION	1	19-10-2022		TLM1	
15.	CHECKING BALANCED PARANTHESIS	1	20-10-2022		TLM1	
16.	QUEUE	1	24-10-2022		TLM1	
17.	QUEUE USING ARRAY	1	26-10-2022		TLM1	
18.	QUEUE USING LINKED LIST	1	27-10-2022		TLM1	
19.	CIRCULAR QUEUE	2	31-10-2022		TLM1	
20.	DEQUE	1	01-11-2022		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	02-11-2022		TLM2	
22.	Insertion Sort	1	03-11-2022		TLM1	
23.	Selection Sort	1	14-11-2022		TLM1	
24.	Merge Sort	2	15-11-2022 & 16-11-2022		TLM1	
25.	Quick Sort	2	17-11-2022 & 21-11-2022		TLM1	
26.	Heap Sort	2	22-11-2022 & 23-11-2022		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	24-11-2022		TLM1	
28.	Tree Traversals	2	28-11-2022 & 29-11-2022		TLM1	
29.	Binary Trees	2	30-11-2022 & 01-12-2022		TLM2	
30.	Binary Search Trees	2	05-12-2022 & 06-12-2022		TLM1	
31.	AVL Trees	2	07-12-2022 & 08-12-2022		TLM1	
32.	Operations	1	12-12-2022		TLM1	
No. of classes required to complete UNIT-IV: 10				**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	2	13-12-2022 & 14-12-2022		TLM1	
34.	REPRESENTATION OF GRAPHS	2	15-12-2022 & 19-12-2022		TLM1	
35.	BFS	2	20-12-2022 & 21-12-2022		TLM1	
36.	DFS	2	22-12-2022 & 26-12-2022		TLM1	
37.	Hashing Introduction, Hash function, separate Chaining	1	27-12-2022		TLM1	
38.	Linear & Quadratic Probing	1	28-12-2022		TLM1	
39.	Double & Rehashing	1	29-12-2022		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	**Mr. P. Jagadeeswara Rao**	**Ms. P. Sarala**	**Dr. K. Naga Prasanthi**	**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.:** 2022-2023

PREREQUISITE: Python Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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.	Superposition theorem	1	13-9-2022		TLM1	
2.	Thevenin theorem	1	14-9-2022		TLM1	
3.	Norton theorem	1	15-9-2022		TLM1	
4.	Maximum Power Transfer theorem	1	16-9-2022		TLM1	
5.	TUTORIAL	1	20-9-2022		TLM3	
6.	Millman theorem	1	21-9-2022		TLM1/TLM2	
7.	Reciprocity theorem	1	22-9-2022		TLM1	
8.	Compensation theorem	1	23-9-2022		TLM1	
9.	TUTORIAL	1	27-9-2022		TLM3	
10.	Concept of duality and dual networks	1	28-9-2022		TLM1/TLM2	
11.	REVISION	1	29-9-2022		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	1	30-9-2022		TLM1	
13	Laplace transforms methods of solutions	1	07-10-2022		TLM1	
14	TUTORIAL	1	11-10-2022		TLM1 & TLM2	
15	Transient response of RLC for D.C Excitation	1	12-10-2022		TLM1	
16	Transient response of R-L & R-C for Sinusoidal Excitation	1	13-10-2022		TLM1	
17	Transient response of RLC for Sinusoidal Excitation	1	14-10-2022		TLM3	
18	TUTORIAL	1	18-10-2022		TLM1	
19	Analysis of Electrical circuits with standard test signals	1	19-10-2022		TLM1& TLM2	
20	Analysis of Electrical circuits with standard test signals	1	20-10-2022		TLM1	
21	Problems	1	21-10-2022		TLM3	
22	TUTORIAL	1	25-10-2022			
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	1	26-10-2022		TLM1	
24	Star-Delta Transformations	1	27-10-2022		TLM1	
25	-I relations in balanced circuits	1	28-10-2022		TLM1	
26	TUTORIAL	1	01-11-2022		TLM1	
27	Analysis of three phase balanced load circuits	1	02-11-2022		TLM1	
28	Analysis of three phase balanced load circuits	1	03-11-2022		TLM1	
29	Analysis of three phase unbalanced load circuits	1	04-11-2022		TLM3	
30	TUTORIAL	1	15-11-2022		TLM1& TLM2	
31	Measurement of power	1	16-11-2022		TLM1	
32	PROBLEMS	1	17-11-2022		TLM1	
33	TUTORIAL	1	18-11-2022		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
34	Two port network parameters	1	22-11-2022		TLM1	
35	Z parameters	1	23-11-2022		TLM1	
36	Y parameters	1	24-11-2022		TLM1	
37	ABCD parameters	1	25-11-2022		TLM3	
38	TUTORIAL	1	29-11-2022		TLM1	
39	Hybrid parameters	1	30-11-2022		TLM1	
40	Relationship between Network parameters	1	01-12-2022		TLM1	
41	Interconnection of two port networks	1	02-12-2022		TLM1 &TLM2	
42	TUTORIAL	1	06-12-2022		TLM1	
43	T and π Network Representation	1	07-12-2022		TLM1	
44	Fourier theorem	1	08-12-2022		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
45	Trigonometric and exponential forms	1	09-12-2022		TLM1	
46	TUTORIAL	1	13-12-2022		TLM1	
47	Analysis of Electrical Circuits to Non sinusoidal periodic waveforms.	1	14-12-2022		TLM1	
48	conditions of symmetry	1	15-12-2022		TLM3	
49	line spectra and phase angle spectra	1	16-12-2022		TLM1	
50	TUTORIAL	1	20-12-2022		TLM1	
51	Low pass ,High pass filters	1	21-12-2022		TLM3	
52	Band pass filters	1	22-12-2022		TLM1	
53	Constant-k Low pass filters	1	23-12-2022		TLM1	
54	TUTORIAL	1	27-12-2022		TLM1	
55	Constant-k High pass filters	1	28-12-2022		TLM1	
56	m-derived filters	1	29-12-2022		TLM1	
57	REVISION	1	30-12-2022		TLM1	
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
58	Image impedance	1	04-01-2023	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**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
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/A **A.Y.:** 2022-2023

PREREQUISITE: Python Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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.	Superposition theorem	1	12-09-2022		TLM1	
2.	Thevenin theorem	1	13-09-2022		TLM1	
3.	Norton theorem	1	14-09-2022		TLM1	
4.	Maximum Power Transfer theorem	1	16-09-2022		TLM1	
5.	Tutorial	1	19-09-2022		TLM1 &TLM2	
6.	Millman theorem	1	20-09-2022		TLM3	
7.	Reciprocity theorem	1	21-09-2022		TLM1	
8.	Compensation theorem	1	23-09-2022		TLM1	
9.	Tutorial	1	26-09-2022		TLM3	
10.	Concept of duality and dual networks	1	27-09-2022		TLM1	
11.	REVISION	1	28-09-2022		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	1	30-09-2022		TLM1	
13	Tutorial	1	10-10-2022		TLM1	
14	Transient response of R-L & R-C for D.C Excitation	1	11-10-2022		TLM1	
15	Transient response of RLC	1	12-10-2022		TLM1	
16	Transient response of R-L & R-C for AC Excitation	1	14-10-2022		TLM1	
17	Tutorial	1	17-10-2022		TLM3	
18	Transient response of RLC for AC Excitation	1	18-10-2022		TLM1	
19	Analysis of Electrical circuits with standard test signals	1	19-10-2022		TLM1	
20	Analysis of Electrical circuits with standard test signals	1	21-10-2022		TLM1	
21	Tutorial	1	25-10-2022			
22	Problems	1	26-10-2022		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	1	28-10-2022		TLM1	
24	Star-Delta Transformations	1	31-10-2022		TLM1	
25	V-I relations in balanced circuits	1	01-11-2022		TLM1	
26	Analysis of three phase balanced load circuits	1	02-11-2022		TLM1	
27	Analysis of three phase balanced load circuits	1	04-11-2022		TLM1	
28	Tutorial	1	14-11-2022		TLM1	
29	Analysis of three phase unbalanced load circuits	1	15-11-2022			
30	Analysis of three phase unbalanced load circuits	1	16-11-2022		TLM1	
31	Measurement of power	1	18-11-2022		TLM1	
32	Tutorial	1	21-11-2022			
33	PROBLEMS	1	22-11-2022		TLM1	
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
34	Two port network parameters	1	23-11-2022		TLM1	
35	Z parameters	1	25-11-2022		TLM1	
36	Tutorial	1	28-11-2022		TLM1	
37	Y parameters	1	29-11-2022		TLM1	
38	ABCD parameters	1	30-11-2022		TLM1	
39	Hybrid parameters	1	02-12-2022		TLM1	
40	Tutorial	1	05-12-2022			
41	Relationship between Network parameters	1	06-12-2022		TLM1	
42	Interconnection of two port networks	1	07-12--2022			
43	T and π Network Representation	1	09-12-2022		TLM1	
44	Tutorial	1	12-12-2022		TLM1	
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
45	Fourier theorem	1	13-12-2022		TLM1	
46	Trigonometric and exponential forms	1	14-12-2022		TLM1	
47	Analysis of Electrical Circuits to Non sinusoidal periodic waveforms.	1	16-12-2022		TLM1	
48	Tutorial	1	19-12-2022		TLM1	
49	conditions of symmetry	1	20-12-2022			
50	line spectra and phase angle spectra	1	21-12-2022		TLM1	
51	Low pass ,High pass filters	1	23-12-2022		TLM1	
52	Tutorial	1	26-12-2022		TLM1	
53	Band pass filters	1	27-12-2022			
54	Constant-k filters	1	28-12-2022		TLM1	
55	m-derived filters	1	30-12-2022		TLM1	
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
56	Image impedance	1	02-01-2023	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.
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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 a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty				
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.: 2022-23**

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
CO1	3	2	2		2										3
CO2	3	2	3		2										3
CO3	3	2	3		2										3
CO4	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:12-09-2022 to 07-01-2023)

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	13-9-2022		TLM1/2	
2.	Number Systems introduction	1	14-9-2022		TLM1/2	
3.	Conversions of number systems	1	16-9-2022		TLM1/2	
4.	Complements--signed and unsigned binary numbers	1	17-9-2022		TLM1/2	
5.	Binary arithmetic	1	20-9-2022		TLM1/2	
6.	Binary codes-BCD,Gray	**1**	21-9-2022		TLM1/2	
7.	Excess-3, ASCII/EBCDIC **Tutorial-1**	2	23-9-2022, 24-9-2022		TLM1/2, **TLM3**	
8.	Binary code conversions	1	27-9-2022		TLM1/2	
9.	Binary code conversions	**1**	28-9-2022		TLM3	
10.	Parity bits, Error detection and correction code-Hamming code	2	30-9-2022, 1-10-2022		TLM1/2	
11.	Boolean algebra-Boolean postulates	1	11-10-2022		TLM1/2	
12.	De Morgan's theorem, duality	1	12-10-2022		TLM1/2	
13.	Canonical forms-SOP form	1	14-10-2022		TLM1/2	
14.	Canonical forms-POS form	1	15-10-2022		TLM1/2	
15.	K-Map minimisation upto 5 variables	1	18-10-2022		TLM1/2	
16.	**Quiz /Tutorial-2**	1	19-10-2022		**TLM3**	
17.	K-map minimisation with don't care conditions	1	21-10-2022		TLM1/2	
No. of classes required to complete UNIT-I: 19				**No. of classes taken:**		

UNIT-II: Boolean Algebra and 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	22-10-2022, 25-10-2022		TLM1/2	
19.	Universal gates NAND, NOR	1	26-10-2022		TLM1/2	
20.	2-level logic gate implementation (AND-OR,OR-AND)	1	28-10-2022		TLM1/2	
21.	2-level logic gate implementation (NAND only, NOR only)	2	29-10-2022, 1-11-2-22		TLM1/2	
22.	Multi-level logic gate implementation AND-OR,OR-AND, NAND only, NOR only; **Tutorial-3**	2	2-11-2022, 4-11-2022		TLM1/2, **TLM3**	
23.	Implementation of AND, OR, NAND, NOR, NOT gates using resistors, diodes, and transistors	2	5-11-2022 **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 hour**		TLM1/2	
26.	Parallel adder/ subtractor	1	**To plan Extra**		TLM1/2	

			hour			
27.	**Mid-I from 07-11-2022 to 12-11-2022**					
28.	Carry look ahead adder	1	15-11-2022		TLM1/2	
29.	BCD adder	1	16-11-2022		TLM1/2	
30.	Magnitude comparator	1	18-11-2022		TLM1/2	
31.	Decoder, Encoder	1	19-11-2022		TLM1/2	
32.	Multiplexer	**1**	22-11-2022		TLM1/2	
33.	Demultiplexer	1	23-11-2022		TLM1/2	
34.	Parity generator/checker	1	25-11-2022		TLM1/2	
35.	**Tutorial-4**	1	26-11-2022		**TLM3**	
36.	Code converters	1	29-11-2022		TLM1/2	
37.	Memories-RAM,ROM,	1	30-11-2022		TLM1/2	
38.	PAL, PLA	1	2-12-2022		TLM1/2	
39.	**Tutorial-5**	1	3-12-2022		**TLM3**	
40.	Implementation of combinational logic using MUX, PROM	1	6-12-2022		TLM1/2	
41.	Implementation of combinational logic using PLA and PAL	**1**	7-12-2022		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	9-12-2022, 13-11-2022		TLM1/2	
43.	Latches, flipflops-D,T	1	14-12-2022		TLM1/2	
44.	Master-slave FF, characteristic equations and excitation tables	**1**	16-12-2022		TLM1/2	
45.	**Tutorial6**	**1**	17-12-2022		**TLM3**	
46.	Modes of triggering-edge and level triggering	1	20-12-2022		TLM1/2	
47.	Realisation of one flip flop using other FFs	1	21-12-2022		TLM1/2	
48.	Registers and their operation-Synchronous and asynchronous counters	1	23-12-2022		TLM1/2	
49.	Modulo-n counter, race around condition	1	24-12-2022		TLM1/2	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: Asynchronous Sequential Circuits and Algorithmic State Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Sequence detector, FSM capabilities and limitations	2	27-12-2022 28-12-2022		TLM1/2	
51.	Mealy and Moore models, Problems	1	30-12-2022		TLM1/2	
52.	Design of sequential circuits	**1**	31-12-2022		TLM1/2	
53.	Algorithmic State Machines, Components of ASM chart	1	**To plan Extra hour**		TLM1/2	
54.	ASM chart-Salient features, Simple examples	1	**To plan Extra hour**		TLM1/2	
55.	**Tutorial-7**	1	**To plan Extra hour**		**TLM3**	
No. of classes required to complete UNIT-V: 8				**No. of classes taken:**		
Mid-II from 02-01-2023 to 07-01-2023						

COURSE DELIVERY PLAN (LESSON PLAN-B/Sec) (Commencement of Classwork:12-09-2022 to 07-01-2023)

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	12-9-2022		TLM1/2	
2.	Number Systems introduction	1	13-9-2022		TLM1/2	
3.	Conversions of Number systems	1	14-9-2022		TLM1/2	
4.	Complements-signed and unsigned binary numbers	1	17-9-2022		TLM1/2	
5.	**Tutorial-1**	1	19-9-2022		**TLM3**	
6.	Binary arithmetic	**1**	20-9-2022		TLM1/2	
7.	Binary codes-BCD,Gray,Excess-3,ASCII/EBCDIC	2	21-9-2022, 24-9-2022		TLM1/2	
8.	Binary code conversions	1	26-9-2022		TLM1/2	
9.	Parity bits	1	27-9-2022		TLM1/2	
10.	Error detection and correction code-Hamming code	1	28-9-2022, 10-10-2022		TLM1/2	
11.	Boolean algebra-Boolean postulates	1	11-10-2022		TLM1/2	
12.	De Morgan's theorem, duality	1	12-10-2022		TLM1/2	
13.	Canonical forms-SOP form	**1**	15-10-2022		TLM1/2	
14.	Canonical forms-POS form	1	17-10-2022		TLM1/2	
15.	**Tutorial-2/Quiz**	1	18-10-2022		**TLM3**	
16.	K-Map minimisation upto 5 variables	**1**	19-10-2022		TLM1/2	
17.	K-map minimisation with don't care conditions	1	22-10-2022		TLM1/2	
18.	Basic Gates- AND,OR, NOT	**1**	25-10-2022		TLM1/2	
No. of classes required to complete UNIT-I: 19				**No. of classes taken:**		

UNIT-II: Boolean Algebra and 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	26-10-2022,		TLM1/2	
20.	2-level logic gate implementation (AND-OR, OR-AND)	1	29-10-2022, 31-10-2022		TLM1/2	
21.	**Tutorial-3**	1	1-11-2022		TLM1/2	
22.	2-level logic gate implementation (NAND only, NOR only)	2	2-11-2022 5-11-2022		**TLM3** TLM1/2	
23.	Multi-level logic gate implementation AND-OR, OR-AND, NAND only, NOR only	2	To plan extra hour		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, subtractors	1	To plan extra hour		TLM1/2	
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 from 07-11-2022 to 12-11-2022					
29.	Carry look ahead adder	1	14-11-2022		TLM1/2	
30.	BCD adder	1	15-11-2022		TLM1/2	
31.	Magnitude comparator	1	16-11-2022		TLM1/2	
32.	Decoder, Encoder	1	19-11-2022		TLM3	
33.	Tutorial-4	1	21-11-2022		TLM3	
34.	Multiplexer	1	22-11-2022		TLM1/2	
35.	Demultiplexer	1	23-11-2022			
36.	Parity generator/checker	1	26-11-2022		TLM1/2	
37.	Code converters	1	28-11-2022		TLM1/2	
38.	Memories-RAM, ROM,	1	29-11-2022		TLM1/2	
39.	PAL, PLA	1	30-11-2022		TLM1/2	
40.	Implementation of combinational logic using MUX, PROM	1	3-12-2022		TLM1/2	
41.	Tutorial-5	1	5-12-2022		TLM3	
42.	Implementation of combinational logic using PLA and PAL	1	6-12-2022		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	7-12-2022,		TLM1/2	
44.	Latches, flipflops-D,T	1	12-12-2022		TLM1/2	
45.	master-slave FF, characteristic equations and excitation tables	2	13-12-2022, 14-12-2022		TLM1/2	
46.	Tutorial-6	1	17-12-2022		TLM3	
47.	Modes of triggering-edge and level triggering	1	19-12-2022		TLM1/2	
48.	Realisation of one flip flop using other FFs	1	20-12-2022		TLM1/2	
49.	Registers and their operation-Synchronous and asynchronous counters	1	21-12-2022		TLM1/2	
50.	Modulo-n counter, race around condition	1	24-12-2022		TLM1/2	
No. of classes required to complete UNIT-IV: 9				No. of classes taken:		

UNIT-V: Asynchronous Sequential Circuits and Algorithmic State Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
51.	Sequence detector, FSM capabilities and limitations	1	26-12-2022		TLM1/2	
52.	Mealy and Moore models	1	27-12-2022		TLM1/2	
53.	Minimisation of completely specified and incompletely specified state machines	1	28-12-2022		TLM1/2	
54.	Tutorial-7	1	31-12-2022		TLM3	
55.	Algorithmic state machines	1	To plan Extra hour		TLM1/2	
56.	Salient features of ASM chart, ASM examples	1	To plan Extra hour		TLM1/2	
57.	System design using data path and control systems, Control implementation	1	To plan Extra hour		TLM1/2	
No. of classes required to complete UNIT-V: 7				No. of classes taken:		
Mid-II from 02-01-2023 to 07-01-2023						

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 : 2022-23

COURSE NAME & CODE : **ELECTRIC AND MAGNETIC FIELDS (17EE02)**

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	13-09-2022		TLM2	
2.	Coulomb's Law	1	14-09-2022		TLM1	
3.	Electric Field Intensity (EFI)	1	16-09-2022		TLM1	
4.	Electric Fields due to continuous charge distributions	1	17-09-2022		TLM1	
5.	EFI due to a line and a surface charge	1	20-09-2022		TLM1	
6.	**Tutorial-I**	1	21-09-2022		TLM6	
7.	Application of Guass's Law	1	23-09-2022		TLM1	
8.	Maxwell's first law	1	24-09-2022		TLM1	
9.	Electric Flux density, Gauss's law	1	27-09-2022		TLM1	
10.	**Tutorial-II problems**	1	28-09-2022		TLM6	
11.	**-Quiz-1/ Assignment-1**	1	30-09-2022		TLM6	
12.	Revision	1	01-10-2022			
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	11-10-2022		TLM1	
14.	**Tutorial-III**	1	12-10-2022		TLM6	
15.	Conductors, Dielectrics,current density & Equation of continuity .	1	14-10-2022		TLM1	
16.	Ohm's law in point form & Behavior of conductors in an electric field	1	15-10-2022		TLM1	

17.	Polarization, Displacement and Convection current, Electric field inside a dielectric material	1	18-10-2022		TLM1	
18.	**Tutorial-IV**	1	19-10-2022		TLM6	
19.	Work done in moving a point charge in an electrostatic field	1	21-10-2022		TLM1	
20.	Electric dipole – Dipole moment , potential and EFI due to an electric dipole	1	22-10-2022		TLM1	
21.	Conductor-Free space and Dielectric boundary conditions	1	25-10-2022		TLM1	
22.	**Tutorial-V**	1	26-10-2022		TLM6	
23.	Capacitance calculation in static electric field	1	28-10-2022		TLM1	
24.	Spherical co-axial capacitors with composite dielectrics	1	29-10-2022		TLM1	
25.	Laplace's and Poison's equations	1	01-11-2022		TLM1	
26.	**Tutorial-VI- Quiz-2/ Assignment-2**	1	02-11-2022		TLM6	
27.	Solution of Laplace's equation in one variable -	1	04-11-2022		TLM1	
28.	Revision		05-11-2022		TLM2	
29.	MID-I EXAM					
30.	MID-I EXAM					
31.	MID-I EXAM					
32.	MID-I EXAM					
No. of classes required to complete UNIT-II		16				

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
33.	Static magnetic fields – Biot-Savart's law	1	15-11-2022		TLM1	
34.	Magnetic field intensity (MFI) due to a straight current carrying filament	1	16-11-2022		TLM1	

35.	MFI due to circular, square and solenoid current carrying wire	1	18-11-2022		TLM1	
36.	**Tutorial-VII**	1	19-11-2022		TLM6	
37.	MFI due to an infinite sheet of current and a long current carrying filament	1	22-11-2022		TLM1	
38.	Relation between magnetic flux, magnetic flux density and MFI, Maxwell's second Equation	1	23-11-2022		TLM1	
39.	Ampere's circuital law and its applications	1	25-11-2022		TLM1	
40.	Point form of Ampere's circuital law	1	26-11-2022		TLM1	
41.	Maxwell's third equation	1	29-11-2022		TLM1	
42.	Field due to a circular loop, rectangular and square loops	1	30-11-2022		TLM1	
No. of classes required to complete UNIT-III		10				

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
43.	Magnetic force - Moving charges in a Magnetic field	1	02-12-2022		TLM1	
44.	Lorentz force equation – force on a current element	1	03-12-2022		TLM1	
45.	Force on a straight and a long current carrying conductor	1	06-12-2022		TLM1	
46.	Force between two straight long and parallel current carrying conductors	1	07-12-2022		TLM1	
47.	Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole	1	09-12-2022		TLM1	
48.	Torque on a current loop, magnetic potential, scalar magnetic potential and its limitations	1	10-12-2022		TLM1	

49.	Vector magnetic potential and its properties& vector Poisson's equations	2	13-12-2022 14-12-2022		TLM1	
50.	Neuman's formulae and Inductance calculation in static magnetic field	1	16-12-2022		TLM1	
51.	**Tutorial-VIII**	1	17-12-2022		TLM6	
No. of classes required to complete UNIT-IV		10				

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	20-12-2022		TLM1	
53.	Self and Mutual inductance & Statically and Dynamically induced EMFs	1	21-12-2022		TLM1	
54.	Mutual inductance between a straight long wire in the same plan	1	23-12-2022		TLM1	
55.	Maxwell's equations integral and point forms	2	27-12-2022 28-12-2022		TLM1	
56.	Modification of Maxwell's equations for time varying fields	2	30-12-2022 31-12-2022		TLM1	
57.	Poynting Theorem and Poynting vector **&** Determination of self-inductance of a solenoid and toroid	1	02-01-2023		TLM1	
58.	**Tutorial-IX/Assignment**	1	03-01-2023		TLM6	
59.	Revision	1	06-01-2023		TLM2	
60.	**Beyond Syllabus:** Wave guide analysis, Wave propagations	1	07-01-2023		TLM2	
61.	MID-II					
62.	MID-II					
63.	MID-II					
64.	MID-II					

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)		

Part - C

EVALUATION PROCESS:

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 a	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO b	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO c	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO d	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO e	**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 f	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO g	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO h	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO i	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO j	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO k	**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 l	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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.

Mr.Dr.K.Harinath Reddy	Mr.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 : 2022-23

COURSE NAME & CODE : **ELECTRIC AND MAGNETIC FIELDS (17EE02)**

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:

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

Part - B
COURSE DELIVERY PLAN (LESSON PLAN): Section-B
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	12-09-2022		TLM2	
2.	Coulomb's Law	1	14-09-2022		TLM1	
3.	Electric Field Intensity (EFI)	1	15-09-2022		TLM1	
4.	Electric Fields due to continuous charge distributions	1	16-09-2022		TLM1	
5.	EFI due to a line and a surface charge	1	19-09-2022		TLM1	
6.	**Tutorial-I**	1	21-09-2022		TLM6	
7.	Application of Guass's Law	1	22-09-2022		TLM1	
8.	Maxwell's first law	1	23-09-2022		TLM1	
9.	Electric Flux density, Gauss's law	1	26-09-2022		TLM1	
10.	**Tutorial-II problems**	1	28-09-2022		TLM6	
11.	**-Quiz-1/ Assignment-1**	1	29-09-2022		TLM6	
12.	Revision	1	30-09-2022		TLM2	
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	10-10-2022		TLM1	
14.	**Tutorial-III**	1	12-10-2022		TLM6	
15.	Conductors, Dielectrics,current density & Equation of continuity .	1	13-10-2022		TLM1	
16.	Ohm's law in point form & Behavior of conductors in an electric field	1	14-10-2022		TLM1	
17.	Polarization,	1	17-10-2022		TLM1	

	Displacement and Convection current, Electric field inside a dielectric material					
18.	**Tutorial-IV**	1	19-10-2022		TLM6	
19.	Work done in moving a point charge in an electrostatic field	1	20-10-2022		TLM1	
20.	Electric dipole – Dipole moment , potential and EFI due to an electric dipole	1	21-10-2022		TLM1	
21.	Conductor-Free space and Dielectric boundary conditions	1	26-10-2022		TLM1	
22.	**Tutorial-V**	1	27-10-2022		TLM6	
23.	Capacitance calculation in static electric field	1	28-10-2022		TLM1	
24.	Spherical co-axial capacitors with composite dielectrics	1	02-11-2022		TLM1	
25.	Laplace's and Poison's equations	1	03-11-2022		TLM1	
26.	**Tutorial-VI- Quiz-2/ Assignment-2**	1	04-11-2022		TLM6	
27.	Solution of Laplace's equation in one variable -	1	04-11-2022		TLM1	
28.	MID-I EXAM					
29.	MID-I EXAM					
30.	MID-I EXAM					
31.	MID-I EXAM					
No. of classes required to complete UNIT-II		15				

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
32.	Static magnetic fields – Biot-Savart's law	1	14-11-2022		TLM1	
33.	Magnetic field intensity (MFI) due to a straight current carrying filament	1	16-11-2022		TLM1	
34.	MFI due to circular, square and solenoid current carrying wire	1	17-11-2022		TLM1	

35.	**Tutorial-VII**	1	18-11-2022		TLM6	
36.	MFI due to an infinite sheet of current and a long current carrying filament	1	21-11-2022		TLM1	
37.	Relation between magnetic flux, magnetic flux density and MFI, Maxwell's second Equation	1	23-11-2022		TLM1	
38.	Ampere's circuital law and its applications	1	24-11-2022		TLM1	
39.	Point form of Ampere's circuital law	1	25-11-2022		TLM1	
40.	Maxwell's third equation	1	28-11-2022		TLM1	
41.	Field due to a circular loop, rectangular and square loops	1	30-11-2022		TLM1	
No. of classes required to complete UNIT-III		10				

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	01-12-2022		TLM1	
43.	Lorentz force equation – force on a current element	1	02-12-2022		TLM1	
44.	Force on a straight and a long current carrying conductor	1	05-12-2022		TLM1	
45.	Force between two straight long and parallel current carrying conductors	1	07-12-2022		TLM1	
46.	Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole	1	08-12-2022		TLM1	
47.	Torque on a current loop, magnetic potential, scalar magnetic potential and its limitations	1	09-12-2022		TLM1	
48.	Vector magnetic potential and its properties& vector	2	12-12-2022 14-12-2022		TLM1	

	Poisson's equations					
49.	Neuman's formulae and Inductance calculation in static magnetic field	1	15-12-2022		TLM1	
50.	**Tutorial-VIII**	1	16-12-2022		TLM6	
No. of classes required to complete UNIT-IV		10				

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
51.	Faraday's laws of electromagnetic induction	1	19-12-2022		TLM1	
52.	Self and Mutual inductance & Statically and Dynamically induced EMFs	1	21-12-2022		TLM1	
53.	Mutual inductance between a straight long wire in the same plan	1	22-12-2022		TLM1	
54.	Maxwell's equations integral and point forms	2	23-12-2022 26-12-2022		TLM1	
55.	Modification of Maxwell's equations for time varying fields	2	28-12-2022 29-12-2022		TLM1	
56.	Poynting Theorem and Poynting vector **&** Determination of self-inductance of a solenoid and toroid	2	30-01-2023 02-01-2023		TLM1	
57.	**Tutorial-IX/ Assignment**	1	04-01-2023		TLM6	
58.	Revision	1	05-01-2023		TLM2	
59.	**Beyond Syllabus:** Wave guide analysis, Wave propagations	1	06-01-2023		TLM2	
60.	MID-II					
61.	MID-II					
62.	MID-II					
63.	MID-II					
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)		

Part - C

EVALUATION PROCESS:

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 a	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO b	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO c	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO d	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO e	**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 f	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO g	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO h	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO i	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO j	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO k	**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 l	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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.

Mr.Dr.K.Harinath Reddy	Mr.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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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 : 2021-22

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	13-09-2022		2	
2.	Population explosion and variations among Nations.	1	16-09-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	20-09-2022		2	
4.	Environmental Hazards	1	23-09-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	27-09-2022		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	30-10-2022		2	
2.	Water Resources	1	11-10-2022		2	
3.	Mineral Resources	1	14-10-2022		2	
4.	Food Resources	1	18-10-2022		2	
5.	Food Resources	1	21-10-2022		2	
6.	Mineral Resources	1	25-10-2022		2	
No. of classes required to complete UNIT-II: 6				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	28-10-2022		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	01-11-2022		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		04-11-2022			
4.	**I MID EXAMINATION**	1	08-11-2022		2	
5.	**I MID EXAMINATION**		11-11-2022			
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	15-11-2022		2	
7.	Man and wild life conflicts. Endangered and endemic species of India	1	18-11-2022		2,3	
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	22-11-2022		2	
No. of classes required to complete UNIT-III: 6				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	25-11-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	29-11-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		02-12-2022		2	
4.	Noise Pollution		06-12-2022		2	
5.	Solid Waste Management	1	09-12-2022		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	13-12-2022		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	16-12-2022		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	20-12-2022		2,3	
3.	Environmental Impact Assessment (EIA)		23-12-2022		2	
4.	Green building, Environmental Law		27-12-2022		2	
5.	Revision	1	30-12-2022		2	
6.	II MID EXAMINATIONS		03-01-2023			
7.	II MID EXAMINATIONS	1	06-01-2023			
No. of classes required to complete UNIT-V: 05				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

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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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Lella Kranthi Kumar/Mr. 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/A-Sec. **A.Y.:** 2021-22

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	12-09-2022		
2.	Linked List Programs	9	19-09-2022, 26-09-2022 10-10-2022		
3.	Stack, Queue Using Arrays, Linked List	3	17-10-2022		
4.	Infix to Postfix, Evaluation of Postfix Expression	6	31-10-2022, 14-11-2022		
5.	Circular Queue Double Ended Queue	3	21-11-2022		
6.	Bubble sort Selection sort Insertion sort	3	28-11-2022		
7.	Merge sort Quick sort	3	05-12-2022		
8.	Heap sort Binary Tree	3	12-12-2022		
9.	Binary Search Tree	3	19-12-2022		
10.	BFS, DFS	3	26-12-2022		
11.	Lab Internal Exam	3	02-01-2023		

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.
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. Lella Kranthi Kumar / Mr. O. Venkata Siva**	**Ms. P. Sarala**	**Dr. K. N. Prashanthi**	**Dr. D. Veeraiah**
Signature				

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

DEPARTMENT OF ELECTRONICS & COMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : JAGADEESWARA RAO P, O VENKATA SHIVA
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.:** 2021-22

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

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. (**Apply - L3**)

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	17-09-2022		
2.	Linked List Programs	9	24-09-2022, 01-10-2022 15-10-2021		
3.	Stack, Queue Using Arrays, Linked List	3	22-10-2022		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	29-10-2022		
5.	Circular Queue Double Ended Queue	3	05-11-2022		
6.	Bubble sort Selection sort Insertion sort	3	19-11-2022		
7.	Merge sort Quick sort	3	26-11-2022		
8.	Heap sort Binary Tree	3	03-12-2022		
9.	Binary Search Tree	3	17-12-2022		
10.	BFS,DFS	3	24-12-2022		
11.	Lab Internal Exam	3	31-02-2022		

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 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	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. Jagadeeswara Rao P**	**Ms. P. Sarala**	**Dr. K. Naga Prasanthi**	**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 / Mrs.R.Padma / Mrs.T.Himabindu
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.:** 2022-23

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 : 21761A0201-224 and LE-12,3,16

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	**21761A0201-203**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**21761A0204-206**	**DEMO**	2	3	4	5	1	2	3	4	5	1			
B-3	**21761A0207-209**	**DEMO**	3	4	5	1	2	3	4	5	1	2			
B-4	**21761A0210-212**	**DEMO**	4	5	1	2	3	4	5	1	2	3			
B-5	**21761A0213-215**	**DEMO**	5	1	2	3	4	5	1	2	3	4			
B-6	**21761A0216-218**	**DEMO**	6	7	8	9	10	6	7	8	9	10			
B-7	**21761A0219-221**	**DEMO**	7	8	9	10	6	7	8	9	10	6			
B-8	**21761A0222-224**	**DEMO**	8	9	10	6	7	8	9	10	6	7			
B-9	**LE-3,12,16**	**DEMO**	9	10	6	7	8	9	10	6	7	8			
B-10	**LE-2,6,8**	**DEMO**	10	6	7	8	9	10	6	7	8	9			

DAY : SATURDAY

Batches : 21761A0225 – 248, LE-5,7,11,13,17,4,9

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	**21761A0225-227**	**DEMO**	1	2	3	4	5	1	2	3	4	5	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	**21761A0228-230**	**DEMO**	2	3	4	5	1	2	3	4	5	1		
B-3	**21761A0231-233**	**DEMO**	3	4	5	1	2	3	4	5	1	2		
B-4	**21761A0234-236**	**DEMO**	4	5	1	2	3	4	5	1	2	3		
B-5	**21761A0237-239**	**DEMO**	5	1	2	3	4	5	1	2	3	4		
B-6	**21761A0240-242**	**DEMO**	6	7	8	9	10	6	7	8	9	10		
B-7	**21761A0243-246**	**DEMO**	7	8	9	10	6	7	8	9	10	6		
B-8	**21761A0246-248**	**DEMO**	8	9	10	6	7	8	9	10	6	7		
B-9	**LE-5,7,11**	**DEMO**	9	10	6	7	8	9	10	6	7	8		
B-10	**LE-13,17,4,9**	**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.

Dr.M.S.Giridhar / Mrs.R.Padma / Mrs.T.Himabindu	Dr.M.S.Giridhar		Dr.J.SIVAVARA PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: T.HIMABINDU/Dr.M.S.GIRIDHAR/
Dr.A.V.G.A.MARTHANDA

Course Name & Code : ELECTRICAL CIRCUITS AND SIMULATION LAB& 20EE54
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/B **A.Y.:** 2021-22
PRE-REQUISITES : Fundamentals of Eletrical circuits

COURSE EDUCATIONAL OBJECTIVES (CEOs): The objective of this lab is to impart hands on experience in verification of circuits laws and theorems, study of circuit characteristics and simulation of time response. It also give 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 electrical circuits using theorems
CO2	Analyze the magnetic circuits
CO3	Design Resonance circuits
CO4	Estimate two port network parameters
CO5	Analyze the electrical circuits using simulation tools

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	PSO 4
Examine the response of AC and DC electric circuits using theorems	2	2		3	2			2	3	2						
Analyze the magnetic circuits	2	2		3	2			2	3	2						
Design resonance circuits	2	2		3	2			2	3	2						
Estimate two port network parameters	2	2		3	2				3	2						
Analyze the electrical circuit using simulation tools	2	2		3	2				3	2						

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

DAY : TUESDAY
Batches : 21761A0249-272,

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
	Tentative date	13 9	20 9	27 9	11 10	18 10	25 10	01 11	15 11	22 11	29 11	06 12	13 12	20 12	27 12	03 01
	Actual date															
B-1	21761A0249 21761A0250 21761A0251	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**	REVISION OF EXPERIMENTS
B-2	21761A0252 21761A0253 21761A0254	DEMO	1	2	3	4	5	6	7	8	9	10				
B-3	21761A0255 21761A0256 21761A0257	DEMO	1	2	3	4	5	6	7	8	9	10				
B-4	21761A0258 21761A0259 21761A0260	DEMO	1	2	3	4	5	6	7	8	9	10				
B-5	21761A0261 21761A0262 21761A0263	DEMO	1	2	3	4	5	6	7	8	9	10				
B-6	21761A0264 21761A0265 21761A0266	DEMO	1	2	3	4	5	6	7	8	9	10				
B-7	21761A0267 21761A0268 21761A0269	DEMO	1	2	3	4	5	6	7	8	9	10				
B-8	21761A0270 21761A0272	DEMO	1	2	3	4	5	6	7	8	9	10				
B-9		DEMO	1	2	3	4	5	6	7	8	9	10				
B-10		DEMO	1	2	3	4	5	6	7	8	9	10				

DAY : THURSDAY

Batches : 20761A0273-294

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	15 9	22 9	29 9	13 10	20 10	27 10	03 11	17 11	24 11	01 12	08 12	15 12	22 12	29 12
	Actual date														
B-1	21761A0273 21761A0274 21761A0275	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	21761A0276 21761A0277 21761A0278	DEMO	1	2	3	4	5	6	7	8	9	10			
B-3	21761A0279 21761A0280 21761A0281	DEMO	1	2	3	4	5	6	7	8	9	10			
B-4	21761A0282 21761A0283 21761A0284	DEMO	1	2	3	4	5	6	7	8	9	10			
B-5	21761A0285 21761A0286 21761A0287	DEMO	1	2	3	4	5	6	7	8	9	10			
B-6	21761A0288 21761A0289 21761A0290	DEMO	1	2	3	4	5	6	7	8	9	10			
B-7	21761A0291 21761A0292 21761A0293 21761A0294	DEMO	1	2	3	4	5	6	7	8	9	10			
B-8		DEMO	1	2	3	4	5	6	7	8	9	10			
B-9		DEMO	1	2	3	4	5	6	7	8	9	10			
B-10		DEMO	1	2	3	4	5	6	7	8	9	10			

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.
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PROGRAMME OUTCOMES (POs):

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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.

Mrs.T.HimaBindu Dr. M.S. Giridhar Dr.A.V.G.A.Marthanda	Dr. M.S. Giridhar	Dr. P.Sobha Rani	Dr.J.S.V.PRASAD
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor:
Course Name & Code : DIGITAL ELECTRONICS LAB & 20EE55
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/III/A **A.Y.:** 2022-23
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-A SCHEDULE

DAY :
Batches :

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
	Tentative date														
	Actual date														
B-1		DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2		DEMO	1	2	3	4	5	6	7	8	9	10			
B-3		DEMO	1	2	3	4	5	6	7	8	9	10			
B-4		DEMO	1	2	3	4	5	6	7	8	9	10			
B-5		DEMO	1	2	3	4	5	6	7	8	9	10			
B-6		DEMO	1	2	3	4	5	6	7	8	9	10			
B-7		DEMO	1	2	3	4	5	6	7	8	9	10			
B-8		DEMO	1	2	3	4	5	6	7	8	9	10			
B-9		DEMO	1	2	3	4	5	6	7	8	9	10			
B-10		DEMO	1	2	3	4	5	6	7	8	9	10			

DAY :

Batches :

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date													
	Actual date													
B-1		DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2		DEMO	1	2	3	4	5	6	7	8	9	10		
B-3		DEMO	1	2	3	4	5	6	7	8	9	10		
B-4		DEMO	1	2	3	4	5	6	7	8	9	10		
B-5		DEMO	1	2	3	4	5	6	7	8	9	10		
B-6		DEMO	1	2	3	4	5	6	7	8	9	10		
B-7		DEMO	1	2	3	4	5	6	7	8	9	10		
B-8		DEMO	1	2	3	4	5	6	7	8	9	10		
B-9		DEMO	1	2	3	4	5	6	7	8	9	10		
B-10		DEMO	1	2	3	4	5	6	7	8	9	10		

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.

			Dr.J.S.V.PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF ELECTRICAL & 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.:** 2022-23
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 :

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
	Tentative date	13-09	20-09	27-09	04-10	11-10	18-10	25-10	01-11	15-11	22-11	29-11	06-12	13-12	20-12	27-12
	Actual date															
B-1		DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2		DEMO	1	2	3	4	5	6	7	8	9	10				
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B-10		DEMO	1	2	3	4	5	6	7	8	9	10				

DAY : THURSDAY

Batches :

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	15-09	22-09	27-09	06-10	13-10	20-10	27-10	03-11	17-11	24-11	01-12	08-12	15-12	22-12	29-12
	Actual date															
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Mr.A.V.RAVIKUMAR Mr.K.NAGALINGA CHARY Mr.V.PRABHAKAR REDDY	Mr.ANJANEYULU NAIK	Dr.A.V.G.AMARTHANDA	Dr.J.S.V.PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD