LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(An Autonomous Institution Since 2010)
Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Accredited by NAAC with Grade 'A' & ISO: 21001:2018, 50001:2018, 14001:2015 certified
Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.M.S.GIRIDHAR
Course Name & Code : UNIVERSAL HUMAN VALUES-II & 20HS01
L-T-P Structure : **4-0-3** **Credits:** 03
Program/Sem/Sec : B.Tech IV-SEM (A-SECTION) **A.Y.:20**23-24

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

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

CO1	Apply the value inputs inlife and profession **(Apply – L3)**
CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the self, and the Body **(Understand – L2)**
CO3	Understand the role of a human being in ensuring harmony in society **(Understand – L2)**
CO4	Understand the role of a human being in ensuring harmony in the nature and existence. **(Understand – L2)**
CO5	Distinguish between ethical and unethical practices (**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							2	2				1			
CO3							3	2				1			
CO4							3	3	2			1			
CO5							2	2	3			2			
1 - Low							**2** –Medium					**3** – High			

TEXTBOOKS:

T1 Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

REFERENCE BOOKS:

R1 Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
R2 Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
R3 The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Need, Basic Guidelines, Content and Process for Value Education

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.	'Natural Acceptance' and Experiential Validation- as the process for self-exploration;	2	02-01-2024 03-01-2024		TLM1/2	
2.	Continuous Happiness and Prosperity- A look at basic Human Aspirations;	1	03-01-2024		TLM1/2	
3.	Continuous Happiness and Prosperity- Right understanding,	1	04-01-2024		TLM1/2	
4.	Continuous Happiness and Prosperity- Relationship.	2	08-01-2024 09-01-2024		TLM1/2	
5.	Continuous Happiness and Prosperity Physical Facility.	1	10-01-2024		TLM1/2	
6.	Continuous Happiness and Prosperity- Understanding Happiness	1	11-01-2024		TLM1/2	
7.	Continuous Happiness and Prosperity - Understanding Prosperity	2	17-01-2024 18-01-2024		TLM1/2	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Understanding Harmony in the Human Being - Harmony in Myself!

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Understanding human being as a co-existence of the sentient 'I' and the material 'Body';	1	22-01-2024		TLM1/2	
9.	Understanding the needs of Self ('I') and 'Body' - happiness and physical facility;	1	23-01-2024		TLM1/2	
10.	Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer);	1	24-01-2024		TLM1/2	
11.	Understanding the characteristics and activities of 'I' and harmony in 'I';	1	25-01-2024		TLM1/2	
12.	Understanding the harmony of I with the Body:	2	29-01-2024 30-01-2024		TLM1/2	
13.	Sanyam and Health;	2	31-01-2024 01-02-2024		TLM1/2	
14.	correct appraisal of Physical needs, meaning of Prosperity in detail	2	05-02-2024 06-02-2024		TLM1/2	
No. of classes required to complete UNIT-II:10				**No. of classes taken:**		

UNIT-III: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Understanding values in human-human relationship;	2	07-02-2024 08-02-2024		TLM1/2	
16.	meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness;	2	12-02-2024 13-02-2024		TLM1/2	
17.	Trust and Respect as the foundational values of relationship;	2	14-02-2024 15-02-2024		TLM1/2	
18.	Understanding the harmony in the society: Resolution, Prosperity, fearlessness	2	19-02-2024 20-02-2024		TLM1/2	
19.	Co-existence as comprehensive Human Goals;	1	21-02-2024		TLM1/2	
20.	Visualizing a universal harmonious order in society- Undivided Society.	1	22-02-2024		TLM1/2	
21.	Universal Order- from family to world family.	1	04-03-2024		TLM1/2	
22.	Gratitude as a universal value in relationships.	1	05-03-2024		TLM1/2	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

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.	Understanding the harmony in the Nature;	2	06-03-2024 07-03-2024		TLM1/2	
24.	Interconnectedness and mutual fulfillment among the four orders of nature- recyclability in nature;	2	11-03-2024 12-03-2024		TLM1/2	
25.	Interconnectedness and mutual fulfillment among the four orders of nature- self regulation in nature;	3	13-03-2024 14-03-2024 18-03-2024		TLM1/2	
26.	Understanding Existence as Co-existence of mutually interacting units in all-pervasive space;	3	19-03-2024 20-03-2024 21-03-2024		TLM1/2	
27.	Holistic perception of harmony at all levels of existence.	3	26-03-2024 27-03-2024		TLM1/2	
No. of classes required to complete UNIT-IV: 13				**No. of classes taken:**		

UNIT-V: Implications of the above Holistic Understanding of Harmony on Professional Ethics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Natural acceptance of human values;	2	28-03-2024 01-04-2024		TLM1/2	
29.	Definitiveness of Ethical Human Conduct;	2	02-04-2024 03-04-2024		TLM1/2	
30.	Basis for Humanistic Education,	2	04-04-2024 08-04-2024		TLM1/2	
31.	Humanistic Constitution and Humanistic Universal Order;	2	10-04-2024 15-04-2024		TLM1/2	
32.	Competence in professional ethics.	2	16-04-2024 18-04-2024		TLM1/2	
33.	Strategy for transition from the present state to Universal Human Order	3	22-04-2024 23-04-2024 24-04-2024		TLM1/2	
34.	Review & Discussion of previous QPs	25-04-2024			TLM1/2	
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 (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.M.S.Giridhar**	**Dr.M.S.Giridhar**	**Dr.B.Srinivasa Rao**	**Dr.J.Sivavara Prasad**
Signature				

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COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.M.S.GIRIDHAR
Course Name & Code **:** UNIVERSAL HUMAN VALUES-II & 20HS01
L-T-P Structure **: 4-0-**0 **Credits:** 03
Program/Sem/Sec : B.Tech IV-SEM (B-SECTION) **A.Y.:2023-24**

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

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

CO1	Apply the value inputs inlife and profession **(Apply – L3)**
CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the self, and the Body **(Understand – L2)**
CO3	Understand the role of a human being in ensuring harmony in society **(Understand – L2)**
CO4	Understand the role of a human being in ensuring harmony in the nature and existence. **(Understand – L2)**
CO5	Distinguish between ethical and unethical practices (**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							2	2				1			
CO3							3	2				1			
CO4							3	3	2			1			
CO5							2	2	3			2			
1 - Low							**2** –Medium					**3** – High			

TEXTBOOKS:

T1 Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

REFERENCE BOOKS:

R1 Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
R2 Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
R3 The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Need, Basic Guidelines, Content and Process for Value Education

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.	'Natural Acceptance' and Experiential Validation- as the process for self-exploration;	2	02-01-2024 03-01-2024		TLM1/2	
2.	Continuous Happiness and Prosperity- A look at basic Human Aspirations;	2	04-01-2024 05-01-2024		TLM1/2	
3.	Continuous Happiness and Prosperity- Right understanding,	2	09-01-2024 10-01-2024		TLM1/2	
4.	Continuous Happiness and Prosperity- Relationship.	2	11-01-2024 12-01-2024		TLM1/2	
5.	Continuous Happiness and Prosperity Physical Facility.	1	17-01-2024		TLM1/2	
6.	Continuous Happiness and Prosperity- Understanding Happiness	1	18-01-2024		TLM1/2	
7.	Continuous Happiness and Prosperity - Understanding Prosperity	1	19-01-2024		TLM1/2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Understanding Harmony in the Human Being - Harmony in Myself!

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Understanding human being as a co-existence of the sentient 'I' and the material 'Body';	2	23-01-2024 24-01-2024		TLM1/2	
9.	Understanding the needs of Self ('I') and 'Body' - happiness and physical facility;	2	25-01-2024 30-01-2024		TLM1/2	
10.	Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer);	2	31-01-2024 01-02-2024		TLM1/2	
11.	Understanding the characteristics and activities of 'I' and harmony in 'I';	1	02-02-2024		TLM1/2	
12.	Understanding the harmony of I with the Body:	2	06-02-2024 07-02-2024		TLM1/2	
13.	Sanyam and Health;	1	08-02-2024		TLM1/2	
14.	correct appraisal of Physical needs, meaning of Prosperity in detail	2	09-02-2024 13-02-2024		TLM1/2	
No. of classes required to complete UNIT-II:12				**No. of classes taken:**		

UNIT-III: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Understanding values in human-human relationship;	2	14-02-2024 16-02-2024		TLM1/2	
16.	meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness;	2	20-02-2024 21-02-2024		TLM1/2	
17.	Trust and Respect as the foundational values of relationship;	2	22-02-2024 23-02-2024		TLM1/2	
18.	Understanding the harmony in the society: Resolution, Prosperity, fearlessness	1	05-03-2024		TLM1/2	
19.	Co-existence as comprehensive Human Goals;	1	06-03-2024		TLM1/2	
20.	Visualizing a universal harmonious order in society- Undivided Society.	1	07-03-2024		TLM1/2	
21.	Universal Order- from family to world family.	1	12-03-2024		TLM1/2	
22.	Gratitude as a universal value in relationships.	1	13-03-2024		TLM1/2	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

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.	Understanding the harmony in the Nature;	2	14-03-2024 15-03-2024		TLM1/2	
24.	Interconnectedness and mutual fulfillment among the four orders of nature- recyclability in nature;	2	19-03-2024 20-03-2024		TLM1/2	
25.	Interconnectedness and mutual fulfillment among the four orders of nature- self regulation in nature;	2	21-03-2024 22-03-2024		TLM1/2	
26.	Understanding Existence as Co-existence of mutually interacting units in all-pervasive space;	2	26-03-2024 27-03-2024		TLM1/2	
27.	Holistic perception of harmony at all levels of existence.	2	28-03-2024 02-04-2024		TLM1/2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Implications of the above Holistic Understanding of Harmony on Professional Ethics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Natural acceptance of human values;	2	03-04-2024 04-04-2024		TLM1/2	
29.	Definitiveness of Ethical Human Conduct;	2	10-04-2024 12-04-2024		TLM1/2	
30.	Basis for Humanistic Education,	2	16-04-2024 18-04-2024		TLM1/2	
31.	Humanistic Constitution and Humanistic Universal Order;	2	19-04-2024 23-04-2024		TLM1/2	
32.	Competence in professional ethics.	2	24-04-2024 25-04-2024		TLM1/2	
33.	Strategy for transition from the present state to Universal Human Order	1	26-04-2024		TLM1/2	
34.	Review & Discussion of previous QPs	07-05-2023 TO 10-05-2023			TLM1/2	
No. of classes required to complete UNIT-V: 16				**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 ring and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.M.S.Giridhar**	**Dr.M.S.Giridhar**	**Dr.B.Srinivasa Rao**	**Dr.J.Sivavara Prasad**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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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: Dr.G.Nageswara Rao
Course Name & Code **:** POWER SYSTEMS-I –20EE08
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/A **A.Y.:** 2023-24

PREREQUISITES: Fundamentals of Electrical Engineering &Basic Civil and Mechanical Engineering

Course Educational Objective: This course enables the student to learn different types of non-renewable power generation methods, various types of renewable power sources, the modes of power transmission, the economic aspects of power generation, tariff methods and design aspects of transmission lines.

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

CO1: Understand the operation of non-renewable electrical power generating stations **(Understand-L2)**
CO2: Illustrate the economic aspects of power generation **(Apply-L3)**
CO3: Understand the A.C distribution system and performance of insulated cables **(Understand-L2)**
CO4: Evaluate the electrical and mechanical parameters of transmission lines **(Apply-L3)**
CO5: Analyze operation of overhead line insulators and phenomena of corona **(Understand-L2)**

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

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSOa	PSOb	PSOc	PSOd
CO1	3	2				3	3				2	2	2			
CO2	3	2				3					2	2	2			
CO3	3	2	1		2		3					1	1	1		
CO4	3	2	1		2		3					1	1	1		
CO5	3	2	1		2							1	1	1		

TEXT BOOKS:

T1	Soni, Gupta & Bahtnagar, Power Systems Engineering, Dhanpat Rai & Sons, 2016.
T2	C.L. Wadhwa, Electrical Power Systems, 6th Edition, New AgeInternational,2009.

REFERENCE BOOKS:

R1	M.V.Deshpande, Elements of Electrical Power Station Design, 3rd, Wheeler Pub.1997.
R2	C.L. Wadhwa, Generation, Distribution and Utilization of Electrical Energy, 3rd Edition, New Age International,2015.
R3	V K Mehta & Rohit Mehta, Principles of Power Systems (Multicolor Edition), 24/e, S.Chand Publishing, 4th Edition ,2005.
R4	W.D.Stevenson, Elements of Power System Analysis, 4th Edition, McGraw Hill, 1982.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: POWER GENERATION METHODS

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.	COs and POs , Introduction	1	2/1/24		TLM1	
2.	Typical layout of an electrical power system	1	4/1/24		TLM1	
3.	Present power scenario in India	1	6/1/24		TLM1	
4.	Generation of electric power Tutorial-1	1	8/1/24		TLM3	
5.	Hydro station	1	9/1/24		TLM2	
6.	Hydro station	1	11/1/24		TLM1	
7.	Steam power plant	1	13/1/24		TLM2	
8.	Steam power plant Tutorial-1	1	18/1/24		TLM1	
9.	Nuclear power plant	1	20/1/24		TLM2	
10.	Nuclear power plant	1	22/1/24		TLM1	
11.	Gas turbine plant	1	23/1/24		TLM2	
12.	Tutorial-2	1	25/1/24		TLM3	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: ECONOMICS OF GENERATION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction, definitions of connected load, maximum demand	1	27/1/24		TLM1	
14.	Demand factor, load factor, diversity factor, Load duration curve, number and size of generator units	1	29/1/24		TLM1	
15.	Base load and peak load plants	1	30/1/24		TLM1	
16.	Tutorila-3	1	1/2/24		TLM3	
17.	Cost of electrical energy-fixed cost, running cost	1	3/2/24		TLM1	
18.	Tariff on charge to customer	1	5/2/24		TLM1	
No. of classes required to complete UNIT-II: 06				**No. of classes taken:**		

UNIT-III: AC DISTRIBUTION & CABLES

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.	Introduction, AC distribution	1	6/2/24		TLM1	
20.	Single phase, 3-phase-3wire, 3 phase 4 wire system	1	8/2/24		TLM1	
21.	Bus bar arrangement	1	10/2/24		TLM1	
22.	Tutorial-4	1	12/2/24		TLM3	
23.	**Insulated Cables:** Introduction	1	13/2/24		TLM1	
24.	Insulation, insulating materials	1	15/2/24		TLM1	
25.	Extra high voltage cables, grading of cables	1	17/2/24		TLM1	

26.	Extra high voltage cables, grading of cables	1	19/2/24		TLM2	
27.	Insulation resistance of a cable	1	20/2/24		TLM1	
28.	capacitance of a single core and three core cables	1	22/2/24		TLM1	
29.	Tutorial-5	1	24/2/24		TLM3	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

Unit-IV: ELECTRICAL AND MECHANICAL DESIGN OF TRANSMISSION LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Transmission line sag calculation	1	2/3/24		TLM1	
31.	The catenary curve, sag tension calculations, supports at different levels, stringing Chart	1	4/3/24		TLM2	
32.	Tutorial-6	1	5/3/24		TLM3	
33.	Inductance and capacitance calculations of transmission lines	1	7/3/24		TLM1	
34.	line conductors, inductance and capacitance of single phase	1	9/3/24		TLM1	
35.	line conductors, inductance and capacitance of three phase lines with symmetrical spacing	1	11/3/24		TLM1	
36.	Tutorial-7	1	12/3/24		TLM3	
37.	line conductors, inductance and capacitance of three phase lines with unsymmetrical spacing	1	14/3/24		TLM1	
38.	Composite conductors-transposition	1	16/3/24		TLM1	
39.	Bundled conductors	1	18/3/24		TLM2	
40.	Ttorial-8	1	19/3/24		TLM3	
41.	Effect of earth on capacitance.	1	21/3/24		TLM1	
42.	Inductance and capacitance calculations	1	23/3/24		TLM1	
No. of classes required to complete UNIT-IV: 13				**No. of classes taken:**		

UNIT-V: CORONA& INSULATORS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss	2	26/3/24 28/3/24		TLM1	
44.	Tutorial-9	1	30/3/24		TLM3	
45.	Methods of reducing corona loss, Disadvantages of corona	2	1/4/24 2/4/24		TLM1	
46.	Interference between power and Communication lines	2	4/4/24 6/4/24		TLM1	
47.	**Overhead Line Insulators**: Introduction, types of insulators	2	8/4/24 13/4/24		TLM2	
48.	Tutorial-10	2	15/4/24 16/4/24		TLM3	

49.	Potential distribution over a string of suspension insulators	2	18/4/24 20/4/24		TLM1	
50.	Methods of equalizing the potential, testing of insulators	2	22/4/24 23/4/24		TLM1	
51.	**(Content beyond syllabus) Impacts of Electric Vehicles on the Power System**	2	25/4/24 27/4/24		TLM2	
No. of classes required to complete UNIT-V: 17				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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	**Dr.G.Nageswara Rao**	**Dr.G.Nageswara Rao**	**Dr.P.Sobha Rani**	**Dr.J.Sivavara Prasad**
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.G.Nageswara Rao
Course Name & Code **:** POWER SYSTEMS-I –20EE08
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/B **A.Y.:** 2023-24

PREREQUISITES: Fundamentals of Electrical Engineering &Basic Civil and Mechanical Engineering

Course Educational Objective: This course enables the student to learn different types of non-renewable power generation methods, various types of renewable power sources, the modes of power transmission, the economic aspects of power generation, tariff methods and design aspects of transmission lines.

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

CO1: Understand the operation of non-renewable electrical power generating stations **(Understand-L2)**
CO2: Illustrate the economic aspects of power generation **(Apply-L3)**
CO3: Understand the A.C distribution system and performance of insulated cables **(Understand-L2)**
CO4: Evaluate the electrical and mechanical parameters of transmission lines **(Apply-L3)**
CO5: Analyze operation of overhead line insulators and phenomena of corona **(Understand-L2)**

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

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSOa	PSOb	PSOc	PSOd
CO1	3	2				3	3				2	2	2			
CO2	3	2				3					2	2	2			
CO3	3	2	1		2		3					1	1	1		
CO4	3	2	1		2		3					1	1	1		
CO5	3	2	1		2							1	1	1		

TEXT BOOKS:

T1	Soni, Gupta & Bahtnagar, Power Systems Engineering, Dhanpat Rai & Sons, 2016.
T2	C.L. Wadhwa, Electrical Power Systems, 6th Edition, New AgeInternational,2009.

REFERENCE BOOKS:

R1	M.V.Deshpande, Elements of Electrical Power Station Design, 3rd, Wheeler Pub.1997.
R2	C.L. Wadhwa, Generation, Distribution and Utilization of Electrical Energy, 3rd Edition, New Age International,2015.
R3	V K Mehta & Rohit Mehta, Principles of Power Systems (Multicolor Edition), 24/e, S.Chand Publishing, 4th Edition ,2005.
R4	W.D.Stevenson, Elements of Power System Analysis, 4th Edition, McGraw Hill, 1982.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I: POWER GENERATION METHODS

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.	COs and POs , Introduction	1	3/1/24		TLM1	
2.	Typical layout of an electrical power system	1	4/1/24		TLM1	
3.	Present power scenario in India	1	5/1/24		TLM1	
4.	Generation of electric power Tutorial-1	1	8/1/24		TLM3	
5.	Hydro station	1	10/1/24		TLM2	
6.	Hydro station	1	11/1/24		TLM1	
7.	Steam power plant	1	12/1/24		TLM2	
8.	Steam power plant Tutorial-1	1	17/1/24		TLM1	
9.	Nuclear power plant	1	18/1/24		TLM2	
10.	Nuclear power plant	1	19/1/24		TLM1	
11.	Gas turbine plant	1	22/1/24		TLM2	
12.	Tutorial-2	1	24/1/24		TLM3	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: ECONOMICS OF GENERATION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction, definitions of connected load, maximum demand	1	25/1/24		TLM1	
14.	Demand factor, load factor, diversity factor, Load duration curve, number and size of generator units	1	29/1/24		TLM1	
15.	Base load and peak load plants	1	31/1/24		TLM1	
16.	Tutorila-3	1	1/2/24		TLM3	
17.	Cost of electrical energy-fixed cost, running cost	1	2/2/24		TLM1	
18.	Tariff on charge to customer	1	5/2/24		TLM1	
No. of classes required to complete UNIT-II: 06				**No. of classes taken:**		

UNIT-III: AC DISTRIBUTION & CABLES

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.	Introduction, AC distribution	1	7/2/24		TLM1	
20.	Single phase, 3-phase-3wire, 3 phase 4 wire system	1	8/2/24		TLM1	
21.	Bus bar arrangement	1	9/2/24		TLM1	
22.	Tutorial-4	1	12/2/24		TLM3	
23.	**Insulated Cables:** Introduction	1	14/2/24		TLM1	
24.	Insulation, insulating materials	1	15/2/24		TLM1	
25.	Extra high voltage cables, grading of cables	1	16/2/24		TLM1	

26.	Extra high voltage cables, grading of cables	1	19/2/24		TLM2	
27.	Insulation resistance of a cable	1	21/2/24		TLM1	
28.	capacitance of a single core and three core cables	1	22/2/24		TLM1	
29.	Tutorial-5	1	23/2/24		TLM3	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

Unit-IV: ELECTRICAL AND MECHANICAL DESIGN OF TRANSMISSION LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Transmission line sag calculation	1	26/2/24		TLM1	
31.	The catenary curve, sag tension calculations, supports at different levels, stringing Chart	1	28/2/24		TLM2	
32.	Tutorial-6	1	29/2/24		TLM3	
33.	Inductance and capacitance calculations of transmission lines	2	1/3/24 4/3/24		TLM1	
34.	line conductors, inductance and capacitance of single phase	2	6/3/24 7/3/24		TLM1	
35.	line conductors, inductance and capacitance of three phase lines with symmetrical spacing	1	11/3/24		TLM1	
36.	Tutorial-7	1	13/3/24		TLM3	
37.	line conductors, inductance and capacitance of three phase lines with unsymmetrical spacing	1	14/3/24		TLM1	
38.	Composite conductors-transposition	1	15/3/24		TLM1	
39.	Bundled conductors	1	18/3/24		TLM2	
40.	Ttorial-8	1	20/3/24		TLM3	
41.	Effect of earth on capacitance.	1	21/3/24		TLM1	
42.	Inductance and capacitance calculations	1	22/3/24		TLM1	
No. of classes required to complete UNIT-IV: 15				**No. of classes taken:**		

UNIT-V: CORONA& INSULATORS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss	1	27/3/24		TLM1	
44.	Tutorial-9	1	28/3/24		TLM3	
45.	Methods of reducing corona loss, Disadvantages of corona	2	1/4/24 3/4/24		TLM1	
46.	Interference between power and Communication lines	2	4/4/24 8/4/24		TLM1	
47.	**Overhead Line Insulators**: Introduction, types of insulators	2	10/4/24 12/4/24		TLM2	
48.	Tutorial-10	2	15/4/24 18/4/24		TLM3	

49.	Potential distribution over a string of suspension insulators	2	19/4/24 22/4/24		TLM1	
50.	Methods of equalizing the potential, testing of insulators	3	24/4/24 25/4/24 26/4/24		TLM1	
51.	**(Content beyond syllabus) Impacts of Electric Vehicles on the Power System**	2	29/4/24 1/5/24		TLM2	
No. of classes required to complete UNIT-V: 17				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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	**Dr.G.Nageswara Rao**	**Dr.G.Nageswara Rao**	**Dr.P.Sobha Rani**	**Dr.J.Sivavara Prasad**
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 : CONTROL SYSTEMS – 20EE09
L-T-P Structure : **2-1-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/A **A.Y.:** 2023-24

Pre-requisites: Electrical circuit Analysis and Applied Physics
Course Educational Objective: The objective of this course is to introduce to the students the principles and applications of control systems in everyday life, the basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

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

CO1	Develop mathematical models of systems in terms of transfer function and state-space. **(Apply-L3)**
CO2	Analyze control systems in time domain **(Apply-L3)**
CO3	Analyze control systems in frequency domain **(Apply-L3)**
CO4	Understand the concepts of controllers and compensators. **(Understand-L2)**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	2	2		1												
CO2	2	2		1												
CO3	2	2		1												
CO4	2	2		1												

TEXT BOOKS:

1. B. C. Kuo , “Automatic Control Systems” John Wiley and Sons ,9th edition,2014.
2. I. J. Nagrath and M. Gopal, “Control Systems Engineering”, New Age International (P) Limited Publishers,6th edition,2018.

REFERENCE BOOKS:

1. Katsuhiko Ogata , “Modern Control Engineering”, Prentice Hall of India Pvt. Ltd., 5th edition,2009
2. Norman S. Nise, Control Systems Engineering, 8th Edition, John Wiley, New Delhi,
3. Richard C Dorf, Robert H Bishop, Modern control systems , 12thedition, Prentice Hall (Pearson education, Inc.), New Delhi 2010.
4. Benzamin C. Kuo and Farid Golnaraghi, Automatic Control Systems,10th Edition, John Wiley, New Delhi, 2017.
5. Rao V. Dukkipati,”Analysis and Design of Control Systems using MATLAB”, NewAge Publishers, 2e, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: MATHEMATICAL MODELLING OF CONTROL 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.	III SEM SEE		02-01-2024		TLM1&TLM2	
2.	III SEM SEE		04-01-2024		TLM1&TLM2	
3.	III SEM SEE		05-01-2024		TLM1&TLM2	
4.	III SEM SEE		06-01-2024		TLM3	
5.	Introduction to COs & Control System		08-01-2024		TLM1&TLM2	
6.	Classification of Control systems		09-01-2024		TLM1&TLM2	
7.	Modeling of Mechanical Systems		11-01-2024		TLM1&TLM2	
8.	Modeling of Mechanical Systems		12-01-2024		TLM1&TLM2	
9.	Modeling of Electrical Systems		18-01-2024		TLM1&TLM2	
10.	analogous Systems (f-v)		19-01-2024		TLM3	
11.	Tutorial		20-01-2024		TLM1&TLM2	
12.	analogous Systems (f-i)		22-01-2024		TLM1&TLM2	
13.	Block Diagram Algebra		23-01-2024		TLM1&TLM2	
14.	Block Diagram Algebra		25-01-2024		TLM1&TLM2	
15.	Tutorial		27-01-2024		TLM3	
16.	Introduction to Signal Flow Graph		29-01-2024		TLM1&TLM2	
17.	Masson's Gain forumla		30-01-2024		TLM1&TLM2	
18.	Feedback Control System Characteristics		01-02-2024		TLM1&TLM2	
19.	Feedback Control System Characteristics		02-02-2024		TLM1&TLM2	
20.	Tutorial		03-02-2024		TLM3	
No. of classes required to complete UNIT-I:				**No. of classes taken:**		

UNIT – II: TIME RESPONSE ANALYSIS-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
21.	Introduction to Time response analysis		05-02-2024		TLM1&TLM2	
22.	Step response of first order systems		06-02-2024		TLM1&TLM2	
23.	Step response of second order systems		08-02-2024		TLM1&TLM2	
24.	Step response of second order systems		09-02-2024		TLM1&TLM2	
25.	Time response specifications		12-02-2024		TLM1&TLM2	
26.	Time response specifications		13-02-2024		TLM1&TLM2	
27.	Time response specifications		15-02-2024		TLM1&TLM2	
28.	Steady state errors and error constants		16-02-2024		TLM1&TLM2	
29.	Tutorial		17-02-2024		TLM3	
30.	Introduction to PI, PD and PID Controllers		19-02-2024		TLM1&TLM2	
No. of classes required to complete UNIT-II:				**No. of classes taken:**		

UNIT – III: TIME RESPONSE ANALYSIS-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
31.	Concepts of stability - Unit-III		20-02-2024		TLM1&TLM2	
32.	Routh stability criterion		22-02-2024		TLM1&TLM2	
33.	Routh stability criterion		23-02-2024		TLM1&TLM2	
34.	Tutorial		24-02-2024		TLM3	
35.	Scheme of Evaluation of MID-I		04-03-2024		TLM1&TLM2	
36.	Relative stability analysis		05-03-2024		TLM1&TLM2	
37.	Root Locus Technique		07-03-2024		TLM1&TLM2	
38.	Construction of root loci		11-03-2024		TLM1&TLM2	
39.	Construction of root loci		12-03-2024		TLM1&TLM2	
40.	Construction of root loci		14-03-2024		TLM1&TLM2	
41.	Construction of root loci		15-03-2024		TLM1&TLM2	
42.	Tutorial		16-03-2024		TLM3	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT – IV: FREQUENCY RESPONSE 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
43.	Introduction to Frequency Domain Analysis-UNIT-IV		18-03-2024		TLM1&TLM2	
44.	Frequency domain specifications		19-03-2024		TLM1&TLM2	
45.	Frequency response		21-03-2024		TLM1&TLM2	
46.	Bode Plot		22-03-2024		TLM1&TLM2	
47.	Tutorial		23-03-2024		TLM3	
48.	Bode Plot		26-03-2024		TLM1&TLM2	
49.	Bode Plot		28-03-2024		TLM1&TLM2	
50.	Tutorial		30-03-2024		TLM3	
51.	Transfer function from the Bode Plot		01-04-2024		TLM1&TLM2	
52.	Polar plot		02-04-2024		TLM1&TLM2	
53.	Nyquist Stability criteria		04-04-2024		TLM1&TLM2	
54.	Tutorial		06-04-2024		TLM3	
55.	Nyquist plot		08-04-2024		TLM1&TLM2	
56.	Nyquist plot		09-04-2024		TLM1&TLM2	
57.	Lag, Lead , Lead-Lag Compensator		12-04-2024		TLM1&TLM2	
No. of classes required to complete UNIT-IV: 14				**No. of classes taken:**		

UNIT – V: STATE SPACE 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
58.	Concept of state variables and State models - UNIT-V		15-04-2024		TLM1&TLM2	
59.	Canonical State Space Models		16-04-2024		TLM1&TLM2	
60.	Canonical State Space Models		18-04-2024		TLM1&TLM2	
61.	Transfer Function		19-04-2024		TLM3	
62.	Tutorial		20-04-2024		TLM1&TLM2	
63.	Solution of state equation		22-04-2024		TLM1&TLM2	
64.	Controllability and observability		23-04-2024		TLM1&TLM2	
65.	Compensator Design		25-04-2024		TLM1&TLM2	
66.	Compensator Design		26-04-2024		TLM1&TLM2	
67.	Tutorial		27-04-2024		TLM3	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.K.R.L.Prasad**	**Dr. P.SOBHARANI**	**Dr.J.S.V.PRASAD**
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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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 : CONTROL SYSTEMS – 20EE09
L-T-P Structure : **2-1-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/B **A.Y.:** 2023-24

Pre-requisites: Electrical circuit Analysis and Applied Physics
Course Educational Objective: The objective of this course is to introduce to the students the principles and applications of control systems in everyday life, the basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

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

CO1	Develop mathematical models of systems in terms of transfer function and state-space. **(Apply-L3)**
CO2	Analyze control systems in time domain **(Apply-L3)**
CO3	Analyze control systems in frequency domain **(Apply-L3)**
CO4	Understand the concepts of controllers and compensators. **(Understand-L2)**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	2	2		1												
CO2	2	2		1												
CO3	2	2		1												
CO4	2	2		1												

TEXT BOOKS:

1. B. C. Kuo , “Automatic Control Systems” John Wiley and Sons ,9th edition,2014.
2. I. J. Nagrath and M. Gopal, “Control Systems Engineering”, New Age International (P) Limited Publishers,6th edition,2018.

REFERENCE BOOKS:

1. Katsuhiko Ogata , “Modern Control Engineering”, Prentice Hall of India Pvt. Ltd., 5th edition,2009
2. Norman S. Nise, Control Systems Engineering, 8th Edition, John Wiley, New Delhi,
3. Richard C Dorf, Robert H Bishop, Modern control systems , 12thedition, Prentice Hall (Pearson education, Inc.), New Delhi 2010.
4. Benzamin C. Kuo and Farid Golnaraghi, Automatic Control Systems,10th Edition, John Wiley, New Delhi, 2017.
5. Rao V. Dukkipati,”Analysis and Design of Control Systems using MATLAB”, NewAge Publishers, 2e, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: MATHEMATICAL MODELLING OF CONTROL 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.	III SEM SEE		02-01-2024		TLM3	
2.	III SEM SEE		03-01-2024		TLM1&TLM2	
3.	III SEM SEE		04-01-2024		TLM1&TLM2	
4.	III SEM SEE		05-01-2024		TLM1&TLM2	
5.	III SEM SEE		06-01-2024		TLM1&TLM2	
6.	Introduction to COs & Control System		09-01-2024		TLM3	
7.	Classification of Control systems		10-01-2024		TLM1&TLM2	
8.	Modeling of Mechanical Systems		11-01-2024		TLM1&TLM2	
9.	Modeling of Mechanical Systems		12-01-2024		TLM1&TLM2	
10.	Modeling of Electrical Systems		18-01-2024		TLM1&TLM2	
11.	Analogous Systems (f-v)		19-01-2024		TLM1&TLM2	
12.	Analogous Systems (f-i)		20-01-2024		TLM1&TLM2	
13.	Tutorial		23-01-2024		TLM3	
14.	Block Diagram Algebra		24-01-2024		TLM1&TLM2	
15.	Block Diagram Algebra		25-01-2024		TLM1&TLM2	
16.	Introduction to Signal Flow Graph		27-01-2024		TLM1&TLM2	
17.	Tutorial		30-01-2024		TLM3	
18.	Masson's Gain formula		31-01-2024		TLM1&TLM2	
19.	Feedback Control System Characteristics		01-02-2024		TLM1&TLM2	
20.	Feedback Control System Characteristics		02-02-2024		TLM1&TLM2	
No. of classes required to complete UNIT-I:				**No. of classes taken:**		

UNIT – II: TIME RESPONSE ANALYSIS-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
21.	Introduction to Time response analysis		03-02-2024		TLM1&TLM2	
22.	Tutorial		06-02-2024		TLM3	
23.	Step response of first order systems		07-02-2024		TLM1&TLM2	
24.	Step response of second order systems		08-02-2024		TLM1&TLM2	
25.	Step response of second order systems		09-02-2024		TLM1&TLM2	
26.	Tutorial		13-02-2024		TLM3	
27.	Time response specifications		14-02-2024		TLM1&TLM2	
28.	Time response specifications		15-02-2024		TLM1&TLM2	
29.	Time response specifications		16-02-2024		TLM1&TLM2	
30.	Steady state errors and error constants		17-02-2024		TLM1&TLM2	
31.	Tutorial		20-02-2024		TLM3	
32.	Introduction to PI, PD and PID Controllers		21-02-2024		TLM1&TLM2	
No. of classes required to complete UNIT-II:				**No. of classes taken:**		

UNIT – III: TIME RESPONSE ANALYSIS-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
33.	Concepts of stability		22-02-2024		TLM1&TLM2	
34.	Routh stability criterion		23-02-2024		TLM1&TLM2	
35.	Routh stability criterion		24-02-2024		TLM1&TLM2	
36.	Tutorial		05-03-2024		TLM3	
37.	Scheme of Evaluation of MID-I		06-03-2024		TLM1&TLM2	
38.	Relative stability analysis		07-03-2024		TLM1&TLM2	
39.	Tutorial		12-03-2024		TLM3	
40.	Root Locus Technique		13-03-2024		TLM1&TLM2	
41.	Construction of root loci		14-03-2024		TLM1&TLM2	
42.	Construction of root loci		15-03-2024		TLM1&TLM2	
43.	Construction of root loci		16-03-2024		TLM1&TLM2	
44.	Tutorial		19-03-2024		TLM3	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT – IV: FREQUENCY RESPONSE 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
45.	Introduction to Frequency Domain Analysis-UNIT-IV		20-03-2024		TLM1&TLM2	
46.	Frequency domain specifications		21-03-2024		TLM1&TLM2	
47.	Frequency response of standard second order system		22-03-2024		TLM1&TLM2	
48.	Bode Plot		23-03-2024		TLM1&TLM2	
49.	Tutorial		26-03-2024		TLM3	
50.	Bode Plot		27-03-2024		TLM1&TLM2	
51.	Bode Plot		28-03-2024		TLM1&TLM2	
52.	Transfer function from the Bode Plot		30-03-2024		TLM1&TLM2	
53.	Tutorial		02-04-2024		TLM3	
54.	Polar plot		03-04-2024		TLM1&TLM2	
55.	Nyquist Stability criteria		04-04-2024		TLM1&TLM2	
56.	Nyquist plot		06-04-2024		TLM1&TLM2	
57.	Tutorial		09-04-2024		TLM3	
58.	Nyquist plot		10-04-2024		TLM1&TLM2	
59.	Lag, Lead , Lead-Lag Compensator		12-04-2024		TLM1&TLM2	
60.	Tutorial		16-04-2024		TLM3	
No. of classes required to complete UNIT-IV: 14				**No. of classes taken:**		

UNIT – V: STATE SPACE 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
61.	Concept of state variables and State models		18-04-2024		TLM1&TLM2	
62.	Canonical State Space Models		19-04-2024		TLM1&TLM2	
63.	Canonical State Space Models		20-04-2024		TLM1&TLM2	
64.	Tutorial		23-04-2024		TLM3	
65.	Transfer Function		24-04-2024		TLM1&TLM2	
66.	Solution of state equation		25-04-2024		TLM1&TLM2	
67.	Concepts of controllability and observability		26-04-2024		TLM1&TLM2	
68.	Compensator Design-Content beyond the syllabus		27-04-2024		TLM1&TLM2	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.K.R.L.Prasad**	**Dr. P.SOBHARANI**	**Dr.J.S.V.PRASAD**
Signature			

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING.

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.K.Harinadha Reddy

Course Name & Code : Analog Electronics - 20EE10

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

Program/Sem/Sec : B.Tech., EEE., IV-Sem., Sections- A A.Y : 2023-24

PRE-REQUISITE: Electronic Circuits and Devices and Network Theory

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to analyze various electronic circuits like large signal amplifiers, feedback amplifiers, high pass, low pass RC circuits, clippers, clampers, comparators etc.

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

CO 1	Analysis of Small Signal, Large Signal and Feedback amplifiers (Apply-L3)
CO 2	Design oscillators for different frequencies (Apply-L3)
CO 3	Analyze High pass, low pass RC circuits (Apply-L3)
CO 4	Apply passive filters for linear &Non-linear wave shaping (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	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO2	3	2	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO3	3	2	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO4	3	2	1	1	-	-	-	-	-	-	-	2	1	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).

TEXT BOOKS:

T1 Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, Publishers, New Delhi, Fourth reprint 2011

T2 J.Millman and H.Taub-"Pulse, Digital and Switching Waveforms"–McGraw-Hill, 1991

REFERENCE BOOKS:

R1 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson Education Publishers, 10th Edition.

R2 S salivahanan, N.Suresh Kumar and A Vallavaraj, "Electronic Devices and Circuits", McGraw Hill 5th edition, 2010.

R3 T.F. Bogart Jr., J.S.Beasley and G.Rico, Electronic Devices and Circuits, Pearson Education edition, 2004.

R4 Anand Kumar-"Pulse and Digital Circuits"-PHI, 2005.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: TRANSISTOR AT HIGH FREQUENCIES

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 Amplifiers, CEOs,Cos and Applications	1	02-01-2024		TLM2	
2.	Amplifier analysis	1	03-01-2024		TLM2	
3.	Transistor at High Frequencies	1	04-01-2024		TLM2	
4.	The hybrid π Common Emitter Transistor model	1	06-01-2024		TLM2	
5.	Hybrid π conductance in terms of low frequency h parameters	1	09-01-2024		TLM1	
6.	Hybrid π conductance in terms of low frequency h parameters	1	10-01-2024		TLM2	
7.	TUTORIAL	1	11-01-2024		TLM3	
8.	Current gain with resistive load	1	18-01-2024		TLM1	
9.	The CE short circuit current gain (f_β and f_T parameters)	1	20-01-2024		TLM1	
10.	Assignment / Quiz/revision	1	23-01-2024		TLM6	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: LARGE-SIGNAL AMPLIFIERS

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.	Power Amplifiers: Classification of large signal Amplifiers	1	24-01-2024		TLM1	
2.	Distortion in amplifiers: second and higher order harmonic distortions	1	25-01-2024		TLM1	
3.	Class- A power amplifier- Direct coupled	1	27-01-2024		TLM2	
4.	Class- A power amplifier- Transformer Coupled	1	30-01-2024		TLM2	
5.	Class- A power amplifier- Transformer Coupled	1	31-01-2024		TLM3	
6.	Class- B Push Pull power amplifier	1	01-02-2024		TLM1	
7.	Class- B Complementary Symmetry power amplifier	1	03-02-2024		TLM1	
8.	TUTORIAL	1	06-02-2024		TLM3	
9.	Class-AB power amplifiers	1	07-02-2024		TLM2	
10.	Class- C, Class- D and Class- S power Amplifiers	1	08-02-2024		TLM1	
11.	Assignment / Quiz/ revision	1	10-02-2024		TLM6	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: FEEDBACK AMPLIFIERS

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 Feedback Amplifiers and it's block diagram representation & Concept of negative and positive feedback	1	13-02-2024		TLM2	
2.	Classification of Negative Feedback Amplifiers	1	14-02-2024		TLM1	
3.	Voltage Series Feedback Amplifier (Block diagram and practical circuit analysis)	1	15-02-2024		TLM1	
4.	TUTORIAL-	1	17-02-2024		TLM3	
5.	Current series Feedback Amplifier (Block diagram and practical circuit analysis)	1	20-02-2024		TLM3	
6.	Voltage shunt and Current shunt feedback Amplifier (Block diagram & practical circuit analysis)	1	21-02-2024		TLM1	
7.	Numericals on Voltage shunt and Current shunt feedback Amplifier	1	22-02-2024		TLM1	
8.	Revision/Content Beyond Syllabus	1	24-02-2024		TLM1	
9.	**I MID EXAM 26-02-2024 TO 02-03-2024**					
10.	Frequency response of feedback amplifiers	1	05-03-2024		TLM2	
11.	Characteristics of Negative feedback Amplifiers	1	06-03-2024		TLM2	
12.	Numerical on Negative feedback Amplifiers	1	07-03-2024		TLM2	
No. of classes required to complete UNIT-III:11				No. of classes taken:		

UNIT-IV : OSCILLATORS

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 Oscillators and it's Classification and Barkhausen Criterion	1	09-03-2024		TLM1	
2.	General form of LC oscillator	1	12-03-2024		TLM1	
3.	Hartley, Colpitts and Clapp Oscillators	1	13-03-2024		TLM1	
4.	TUTORIAL-	1	14-03-2024		TLM3	
5.	RC phase shift oscillator using BJT	1	16-03-2024		TLM2	
6.	RC phase shift oscillator using FET	1	19-03-2024		TLM2	
7.	Problems on oscillators	1	20-03-2024		TLM2	
8.	Wein Bridge Oscillator	1	21-03-2024		TLM2	

9.	Crystal Oscillator	1	23-03-2024		TLM1	
10.	Frequency and Amplitude Stability of Oscillators	1	26-03-2024		TLM2	
11.	Problems on Frequency and Amplitude Stability of Oscillators	1	27-03-2024		TLM2	
12.	Tutorial	1	28-03-2024		TLM3	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V : LINEAR & NON-LINEAR WAVESHAPING

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.	RC Circuit as a Low Pass Filter and its response to sinusoidal, step and pulse inputs	1	30-03-2024		TLM2	
2.	Square wave and Ramp input to RC Low Pass Filter	1	02-04-2024		TLM2	
3.	TUTORIAL	1	03-04-2024		TLM3	
4.	RC Circuit as a High Pass Filter and its response to sinusoidal, step & pulse inputs	1	04-04-2024		TLM1	
5.	Problems on High Pass Filter	1	06-04-2024		TLM2	
6.	Square wave and Ramp input to RC High Pass Filter	1	10-04-2024		TLM2	
7.	Clipping at two independent levels, Zener diode clippers	1	16-04-2024		TLM2	
8.	Diode clippers, Transistor clippers, Comparators	1	18-04-2024		TLM1	
9.	Problems on Clippers	1	20-04-2024		TLM1	
10.	Different clamper circuits, Clamping circuit theorem	1	23-04-2024		TLM1	
11.	Numerical on Clamping Circuits	1	24-04-2024		TLM2	
12.	Revision	1	25-04-2024		TLM2	
13.	**BEYOND THE SYLLABUS**: OP-AMP &Applications	1	27-04-2024		TLM2	
No. of classes required to complete UNIT-V: 13				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (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 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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.K.Harinadha Reddy	Dr.K.Harinadha Reddy	Dr.AVGA.Marthanda	(Dr.J.S.V.PRASAD)

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING.

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.K.Harinadha Reddy

Course Name & Code : Analog Electronics - 20EE10

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

Program/Sem/Sec : B.Tech., EEE., IV-Sem., Sections- B A.Y : 2023-24

PRE-REQUISITE: Electronic Circuits and Devices and Network Theory

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to analyze various electronic circuits like large signal amplifiers, feedback amplifiers, high pass, low pass RC circuits, clippers, clampers, comparators etc.

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

CO 1	Analysis of Small Signal, Large Signal and Feedback amplifiers (Apply-L3)
CO 2	Design oscillators for different frequencies (Apply-L3)
CO 3	Analyze High pass, low pass RC circuits (Apply-L3)
CO 4	Apply passive filters for linear &Non-linear wave shaping (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	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO2	3	2	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO3	3	2	1	1	-	-	-	-	-	-	-	2	1	1	2	2
CO4	3	2	1	1	-	-	-	-	-	-	-	2	1	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).

TEXT BOOKS:

T1 Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, Publishers, New Delhi, Fourth reprint 2011

T2 J.Millman and H.Taub-"Pulse, Digital and Switching Waveforms"–McGraw-Hill, 1991

REFERENCE BOOKS:

R1 R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson Education Publishers, 10th Edition.

R2 S salivahanan, N.Suresh Kumar and A Vallavaraj, "Electronic Devices and Circuits", McGraw Hill 5th edition, 2010.

R3 T.F. Bogart Jr., J.S.Beasley and G.Rico, Electronic Devices and Circuits, Pearson Education edition, 2004.

R4 Anand Kumar-"Pulse and Digital Circuits"-PHI, 2005.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: TRANSISTOR AT HIGH FREQUENCIES

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 Amplifiers, CEOs,Cos and Applications	1	02-01-2024		TLM2	
2.	Amplifier analysis	1	03-01-2024		TLM2	
3.	Transistor at High Frequencies	1	05-01-2024		TLM2	
4.	The hybrid π Common Emitter Transistor model	1	08-01-2024		TLM2	
5.	Hybrid π conductance in terms of low frequency h parameters	1	09-01-2024		TLM1	
6.	Hybrid π conductance in terms of low frequency h parameters	1	10-01-2024		TLM2	
7.	TUTORIAL	1	12-01-2024		TLM3	
8.	Current gain with resistive load	1	19-01-2024		TLM1	
9.	The CE short circuit current gain (f_β and f_T parameters)	1	22-01-2024		TLM1	
10.	Assignment / Quiz/revision	1	23-01-2024		TLM6	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: LARGE-SIGNAL AMPLIFIERS

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.	Power Amplifiers: Classification of large signal Amplifiers	1	24-01-2024		TLM1	
2.	Distortion in amplifiers: second and higher order harmonic distortions	1	29-01-2024		TLM1	
3.	Class- A power amplifier- Direct coupled	1	30-01-2024		TLM2	
4.	Class- A power amplifier- Transformer Coupled	1	31-01-2024		TLM2	
5.	Class- A power amplifier- Transformer Coupled	1	02-02-2024		TLM3	
6.	Class- B Push Pull power amplifier	1	05-02-2024		TLM1	
7.	Class- B Complementary Symmetry power amplifier	1	06-02-2024		TLM1	
8.	TUTORIAL	1	07-02-2024		TLM3	
9.	Class-AB power amplifiers	1	09-02-2024		TLM2	
10.	Class- C, Class- D and Class- S power Amplifiers	1	12-02-2024		TLM1	
11.	Assignment / Quiz/ revision	1	13-02-2024		TLM6	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: FEEDBACK AMPLIFIERS

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 Feedback Amplifiers and it's block diagram representation & Concept of negative and positive feedback	1	14-02-2024		TLM2	
2.	Classification of Negative Feedback Amplifiers	1	16-02-2024		TLM1	
3.	Voltage Series Feedback Amplifier (Block diagram and practical circuit analysis)	1	19-02-2024		TLM1	
4.	TUTORIAL-	1	20-02-2024		TLM3	
5.	Current, Voltage series Feedback Amplifier & shunt feedback Amplifier (Block diagram and practical circuit analysis)	1	21-02-2024		TLM3	
6.	Revision/Content Beyond Syllabus	1	23-02-2024		TLM1	
7.	**I MID EXAM 26-02-2024 TO 02-03-2024**					
8.	Frequency response of feedback amplifiers	1	04-03-2024		TLM2	
9.	Characteristics of Negative feedback Amplifiers	1	05-03-2024		TLM2	
10.	Numerical on Negative feedback Amplifiers	1	06-03-2024		TLM2	
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV : OSCILLATORS

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 Oscillators and it's Classification and Barkhausen Criterion	1	11-03-2024		TLM1	
2.	General form of LC oscillator	1	12-03-2024		TLM1	
3.	Hartley, Colpitts and Clapp Oscillators	1	13-03-2024		TLM1	
4.	TUTORIAL-	1	15-03-2024		TLM3	
5.	RC phase shift oscillator using BJT	1	18-03-2024		TLM2	
6.	RC phase shift oscillator using FET	1	19-03-2024		TLM2	
7.	Problems on oscillators	1	20-03-2024		TLM2	
8.	Wein Bridge Oscillator	1	22-03-2024		TLM2	
9.	Crystal Oscillator	1	26-03-2024		TLM1	
10.	Frequency and Amplitude Stability of Oscillators	1	27-03-2024		TLM2	

11.	Problems on Frequency and Amplitude Stability of Oscillators	1	01-04-2024		TLM2	
12.	Tutorial	1	02-04-2024		TLM3	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V : LINEAR & NON-LINEAR WAVESHAPING

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.	RC Circuit as a Low Pass Filter and its response to sinusoidal, step and pulse inputs	1	03-04-2024		TLM2	
2.	Square wave and Ramp input to RC Low Pass Filter	1	08-04-2024		TLM2	
3.	TUTORIAL	1	10-04-2024		TLM3	
4.	RC Circuit as a High Pass Filter and its response to sinusoidal, step & pulse inputs	1	12-04-2024		TLM1	
5.	Square wave and Ramp input to RC High Pass Filter	1	15-04-2024		TLM2	
6.	Clipping at two independent levels, Zener diode clippers	1	16-04-2024		TLM2	
7.	Diode clippers, Transistor clippers, Comparators	1	19--04-2024		TLM1	
8.	Problems on Clippers	1	22-04-2024		TLM1	
9.	Different clamper circuits, Clamping circuit theorem	1	23-04-2024		TLM1	
10.	Numerical on Clamping Circuits	1	24-04-2024		TLM2	
11.	Revision / **CONTENT BEYOND THE SYLLABUS**: OP-AMP &Applications	1	26-04-2024		TLM2	
No. of classes required to complete UNIT-V: 12				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**

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

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 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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.K.Harinadha Reddy	Dr.K.Harinadha Reddy	Dr.AVGA.Marthanda	(Dr.J.S.V.PRASAD)

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.T.Nagadurga
Course Name & Code : ELECTRICAL MACHINES-I –20EE11
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/A **A.Y.:** 2023-24

PREREQUISITE: Electric and magnetic fields

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to learn the principle, construction and performance characteristics of DC Machines and Transformers, methods of speed control of a DC motor and different connections of poly-phase transformers.

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

CO1	Understand the concepts of construction, operation and performance of dc generators. **(Understand-L2)**
CO2	Analyze the operation and performance of dc motors. **(Understand-L2)**
CO3	Evaluate the performance of single phase transformers. **(Apply-L3)**
CO4	Analyze the performance of three phase transformers.**(Understand-L2)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSOa	PSOb	PSOc	PSOd
CO1	2	2											2			3
CO2	2	2	2											2		2
CO3	2	2	2									1	2			2
CO4	2	2	2									2	2			2
1 - Low						**2 –**Medium						**3 -** High				

TEXTBOOKS:

T1	P.S. Bimbra, "Electrical Machinery" , Khanna Publishers, 7th Edition, 2014.
T2	I.J.Nagrath&D.P.Kothari, "Electric Machines", Tata Mc Graw Hill, 7th Edition.2004

REFERENCE BOOKS:

R1	M.G. Say ,"Alternating Current Machines", John Wiley & Sons, 5th edition, 2002.
R2	A. E. Fitzgerald, C. Kingsley, S. Umans ,"Electric Machinery ", Tata Mc Graw Hill, 7theditон, 2013.
R3	Ashfaq Husain, "Electric Machines", Dhanapati Rai & Co, New Delhi, 2nd edition, 2014.
R4	Clayton. A.E, "Performance and Design of Direct Current Machines" CBS Publishers, 1st edition, 2004.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: D.C. GENERATORS

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.	Construction of D.C. Generators	1	02-01-2024		TLM1	
2.	Principle of Operation of D.C. Generators & E.M.F Equation D.C. Generator	2	03-01-2024 03-01-2024		TLM1	
3.	Types of D.C Generators	1	04-01-2024		TLM1	
4.	Tutorial-1	1	05-01-2024		TLM3	
5.	Armature reaction in D.C. Generator	2	09-01-2024		TLM1	
6.	Methods of reducing the effects of armature reaction- Compensating winding	1	10-01-2024 10-01-2024		TLM1	
7.	Commutation	1	11-01-2024		TLM1	
8.	Methods of improving commutation	2	18-01-2024		TLM1	
9.	Tutorial- 2	1	19-01-2024		TLM3	
10.	Losses in a dc machine-Power stages	1	23-01-2024		TLM1	
11.	Efficiency & Condition for maximum efficiency	1	24-01-2024		TLM1	
12.	Problems	1	24-01-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: CHARACTERISTICS OF DC GENERATORS

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.	O.C.C-Voltage build up in generators-Critical field resistance and critical speed	2	25-01-2024 30-01-2024		TLM1	
14.	Causes for failure to self excite and Remedial measures	1	31-01-2024		TLM1	
15.	Load characteristics of shunt Generator	2	31-01-2024 01-02-2024		TLM1	
16.	Tutorial-3	1	02-02-2024		TLM3	
17.	Load characteristics of series Generator	1	06-02-2024		TLM1	
18.	Load characteristics of compound Generator	1	07-02-2024		TLM1	
19.	Tutorial-4	1	07-02-2024		TLM3	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT-III: D.C MOTORS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Principle of operation of D.C. Motor	1	08-02-2024		TLM1	
21.	Back E.M.F. equation and Torque equation of D.C. Motor	1	09-02-2024		TLM1	
22.	Characteristics and application of shunt, series and compound motors	1	13-02-2024		TLM1	
23.	Armature reaction and commutation in D.C Motor	1	14-02-2024		TLM1	
24.	Tutorial-5	1	14-02-2024		TLM3	
25.	Speed control methods	2	15-02-2024 16-02-2024		TLM1	
26.	Starters-3 point and 4 point starters	1	20-02-2024		TLM1	
27.	Tutorial-6	1	21-02-2024		TLM3	

28.	Constant and Variable losses, calculation of efficiency & condition for maximum efficiency	2	21-02-2024 22-02-2024		TLM1	
29.	Tutorial -problems	1	23-02-2024		TLM3	
30.	Brake test on DC Motor	1	03-03-2024		TLM1	
31.	Swinburne's test	1	06-03-2024		TLM1	
32.	Hopkinson's test	1	06-03-2024		TLM1	
33.	Retardation Test	1	07-03-2024		TLM1	
No. of classes required to complete UNIT-III: 16				**No. of classes taken:**		

UNIT-IV: Single Phase Transformer

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.	Constructional details of Transformer-core, windings, insulation, bushings & cooling	2	12-03-2024 13-03-2024		TLM1	
35.	Types of transformers	1	14-03-2024		TLM1	
36.	Emf equation of transformer - operation of transformer on no-load and on-load	1	15-03-2024		TLM1	
37.	Phasor diagrams of transformer – Equivalent circuit of transformer	1	19-03-2024		TLM1	
38.	Losses, efficiency and regulation.	2	20-03-2024 20-03-2024		TLM1	
39.	All day efficiency-effect of frequency & supply voltage on core losses	1	21-03-2024		TLM1	
40.	Minimization of hysteresis and eddy current losses	1	22-03-2024		TLM1	
41.	Tutorial-7	1	26-03-2024		TLM3	
42.	Parallel operation with equal and unequal voltage	1	27-03-2024		TLM1	
43.	Testing- O.C and S.C tests	1	27-03-2024		TLM1	
44.	Sumpner's (back to back) test - predetermination of efficiency and regulation	1	28-03-2024		TLM1	
45.	Separation of losses & load test on transformer	1	04-04-2024		TLM1	
46.	Tutorial-8	1	05-04-2024		TLM3	
No. of classes required to complete UNIT-IV: 15				**No. of classes taken:**		

UNIT-V: Auto Transformers & Poly Phase Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Auto transformers- comparison with two winding transformers	2	10-04-2024 10-04-2024		TLM1	
48.	Tutorial-9	1	11-04-2024		TLM3	
49.	Poly-phase transformers & Poly-phase connections - Y/Y, Y/Δ	1	12-04-2024		TLM1	
50.	Poly-phase connections - Δ/Y, Δ/Δ	2	16-04-2024		TLM1	
51.	Tutorial-10	1	18-04-2024		TLM3	
52.	open Δ-Scott connection	1	19-04-2024		TLM1	
53.	three winding transformers-tertiary windings	1	23-04-2024		TLM1	
54.	off load and on load tap changing	1	24-04-2024		TLM1	
55.	Content beyond syllabus	1	25-04-2024		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	01-01-2024	24-02-2024	8W
I Mid Examinations	26-02-2024	02-03-2024	1W
II Phase of Instructions	04-03-2024	27-04-2024	8W
II Mid Examinations	29-04-2024	04-05-2024	1W
Preparation and Practicals	06-05-2024	11-05-2024	1W
Semester End Examinations	13-05-2024	25-05-2024	2W
Internship	27-05-2024	06-07-2024	6W

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	**Dr.T.Naga Durga**	**Dr.T.Naga Durga**	**Mr.P.Deepak Reddy**	**Dr.J.SIVAVARA PRASAD**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.R.Padma
Course Name & Code **:** ELECTRICAL MACHINES-I –20EE11
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/IV/B **A.Y.:** 2023-24

PREREQUISITE: Electric and magnetic fields

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to learn the principle, construction and performance characteristics of DC Machines and Transformers, methods of speed control of a DC motor and different connections of poly-phase transformers.

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

CO1	Understand the concepts of construction, operation and performance of dc generators. **(Understand-L2)**
CO2	Analyze the operation and performance of dc motors. **(Understand-L2)**
CO3	Evaluate the performance of single phase transformers. **(Apply-L3)**
CO4	Analyze the performance of three phase transformers.**(Understand-L2)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSOa	PSOb	PSOc	PSOd
CO1	2	2											2			3
CO2	2	2	2											2		2
CO3	2	2	2									1	2			2
CO4	2	2	2									2	2			2
1 - Low						**2 –**Medium							**3 -** High			

TEXTBOOKS:

T1	P.S. Bimbra, "Electrical Machinery" , Khanna Publishers, 7th Edition, 2014.
T2	I.J.Nagrath&D.P.Kothari, "Electric Machines", Tata Mc Graw Hill, 7th Edition.2004

REFERENCE BOOKS:

R1	M.G. Say ,"Alternating Current Machines", John Wiley & Sons, 5th edition, 2002.
R2	A. E. Fitzgerald, C. Kingsley, S. Umans ,"Electric Machinery ", Tata Mc Graw Hill, 7theditон, 2013.
R3	Ashfaq Husain, "Electric Machines", Dhanapati Rai & Co, New Delhi, 2nd edition, 2014.
R4	Clayton. A.E, "Performance and Design of Direct Current Machines" CBS Publishers, 1st edition, 2004.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: D.C. GENERATORS

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.	Construction of D.C. Generators	1	01-01-2024		TLM1	
2.	Principle of Operation of D.C. Generators & E.M.F Equation D.C. Generator	2	02-01-2024 03-01-2024		TLM1	
3.	Types of D.C Generators	1	06-01-2024		TLM1	
4.	Tutorial-1	1	08-01-2024		TLM3	
5.	Armature reaction in D.C. Generator	2	09-01-2024 10-01-2024		TLM1	
6.	Methods of reducing the effects of armature reaction- Compensating winding	1	12-01-2024		TLM1	
7.	Commutation	1	19-01-2024		TLM1	
8.	Methods of improving commutation	2	20-01-2024 23-01-2024		TLM1	
9.	Tutorial- 2	1	22-01-2024		TLM3	
10.	Losses in a dc machine-Power stages	1	24-01-2024		TLM1	
11.	Efficiency & Condition for maximum efficiency	1	27-01-2024		TLM1	
12.	Problems	1	29-01-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: CHARACTERISTICS OF DC GENERATORS

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.	O.C.C-Voltage build up in generators-Critical field resistance and critical speed	2	30-01-2024 31-01-2024		TLM1	
14.	Causes for failure to self excite and Remedial measures	1	02-02-2024		TLM1	
15.	Load characteristics of shunt Generator	2	03-02-2024 06-02-2024		TLM1	
16.	Tutorial-3	1	05-02-2024		TLM3	
17.	Load characteristics of series Generator	1	07-02-2024		TLM1	
18.	Load characteristics of compound Generator	1	09-02-2024		TLM1	
19.	Tutorial-4	1	12-02-2024		TLM3	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT-III: D.C MOTORS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Principle of operation of D.C. Motor	1	13-02-2024		TLM1	
21.	Back E.M.F. equation and Torque equation of D.C. Motor	1	14-02-2024		TLM1	
22.	Characteristics and application of shunt, series and compound motors	1	16-02-2024		TLM1	
23.	Armature reaction and commutation in D.C Motor	1	17-02-2024		TLM1	
24.	Tutorial-5	1	19-02-2024		TLM3	
25.	Speed control methods	2	20-02-2024 21-02-2024		TLM1	
26.	Starters-3 point and 4 point starters	1	24-02-2024		TLM1	

27.	Tutorial-6	1	04-03-2024		TLM3	
28.	Constant and Variable losses, calculation of efficiency & condition for maximum efficiency	2	05-03-2024 06-03-2024		TLM1	
29.	Tutorial -problems	1	11-03-2024		TLM3	
30.	Brake test on DC Motor	1	12-03-2024		TLM1	
31.	Swinburne's test	1	13-03-2024		TLM1	
32.	Hopkinson's test	1	15-03-2024		TLM1	
33.	Retardation Test	1	16-03-2024		TLM1	
No. of classes required to complete UNIT-III: 16				**No. of classes taken:**		

UNIT-IV: Single Phase Transformer

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.	Constructional details of Transformer-core, windings, insulation, bushings & cooling	2	18-03-2024 19-03-2024		TLM1	
35.	Types of transformers	1	20-03-2024		TLM1	
36.	Emf equation of transformer - operation of transformer on no-load and on-load	1	22-03-2024		TLM1	
37.	Phasor diagrams of transformer – Equivalent circuit of transformer	1	22-04-2023		TLM1	
38.	Losses, efficiency and regulation.	2	23-03-2024 26-03-2024		TLM1	
39.	All day efficiency-effect of frequency & supply voltage on core losses	1	27-03-2024		TLM1	
40.	Minimization of hysteresis and eddy current losses	1	30-03-2024		TLM1	
41.	Tutorial-7	1	01-04-2024		TLM3	
42.	Parallel operation with equal and unequal voltage	1	02-04-2024		TLM1	
43.	Testing- O.C and S.C tests	1	03-04-2024		TLM1	
44.	Sumpner's (back to back) test - predetermination of efficiency and regulation	1	05-04-2024		TLM1	
45.	Separation of losses & load test on transformer	1	06-04-2024		TLM1	
46.	Tutorial-8	1	08-04-2024		TLM3	
No. of classes required to complete UNIT-IV: 15				**No. of classes taken:**		

UNIT-V: Auto Transformers & Poly Phase Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Auto transformers- comparison with two winding transformers	2	10-04-2024 12-04-2024		TLM1	
48.	Tutorial-9	1	15-04-2024		TLM3	
49.	Poly-phase transformers & Poly-phase connections - Y/Y, Y/Δ	1	16-04-2024		TLM1	
50.	Poly-phase connections - Δ/Y, Δ/Δ	2	19-04-2024 20-04-2024		TLM1	
51.	Tutorial-10	1	22-04-2024		TLM3	
52.	open Δ-Scott connection	1	23-04-2024		TLM1	
53.	three winding transformers-tertiary windings	1	24-04-2024		TLM1	
54.	off load and on load tap changing	1	26-04-2024		TLM1	
55.	Content beyond syllabus	1	27-04-2024		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	01-01-2024	24-02-2024	8W
I Mid Examinations	26-02-2024	02-03-2024	1W
II Phase of Instructions	04-03-2024	27-04-2024	8W
II Mid Examinations	29-04-2024	04-05-2024	1W
Preparation and Practicals	06-05-2024	11-05-2024	1W
Semester End Examinations	13-05-2024	25-05-2024	2W
Internship	27-05-2024	06-07-2024	6W

PART-C

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

EVALUATION PROCESS (R20 Regulation):

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mrs.R.Padma**	**Mrs T.Naga Durga**	**Mr.P.Deepak Reddy**	**Dr.J.SIVAVARA PRASAD**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.T.Hima Bindu, Mrs.G.Tabita
Course Name & Code : Programming Using Python Lab(20AD53)
L-T-P Structure : 1-0-2 Credits : 2
Program/Sem/Sec : B.Tech.(EEE) IV-Sem., A A.Y: 2023-24

PRE-REQUISITE:C Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO 1	Identify various programming constructs available in Python and apply them in solving computational problems. (Applying - L3)
CO 2	Demonstrate data structures available in Python and apply them in solving computational problems. (Applying - L3)
CO 3	Implement modular programming, string manipulations and Python Libraries (Applying - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values. (Applying - 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	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	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).

PART-B

Introduction: Language basics and example problems

a) Implement Python Script for checking the given year is leap year or not.
b) Implement Python Script for finding biggest number among 3 numbers.
c) Implement Python Script for displaying reversal of a number.
d) Implement Python Script to check given number is Armstrong or not.
e) Implement Python Script to print sum of N natural numbers.
f) Implement Python Script to check given number is palindrome or not.
g) Implement Python script to print factorial of a number.
h) Implement Python Script to print all prime numbers within the given range.
i) Implement Python Script to calculate the series: $S=1+x^1+x^2+x^3+.....x^n$
j) Implement Python Script to print the following pattern:

```
*
*   *
*   *   *
```

Modue 1: Exercise Programs on Lists.

a) Write a Python script to display elements of list in reverse order.
b) Write a Python script to find the minimum and maximum elements without using built-in operations in the lists.
c) Write a Python script to remove duplicates from a list.
d) Write a Python script to append a list to the second list.
e) Write a Python script to count the number of strings in a list where the string length is 2 or more.

Module 2: Exercise Programs on Tuples.

a) Write a Python script to create a tuple with different data types.
b) Write a Python script to find the repeated items of a tuple.
c) Write a Python script to replace last value of tuples in a list.
   Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]
   Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]
d) Write a Python script to sort a tuple by its float element.
   Sample data: [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]
   Expected Output: [('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]

Module 3: Exercise Programs on Sets.

a) Write a Python script to add member(s) in a set.
b) Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.

c) Write Python script to test whether every element in S is in T and every element in T is in S.

Module 4: Exercise Programs on Dictionaries

a) Write a Python script to sort (ascending and descending) a dictionary by value.
b) Write a Python script to check whether a given key already exists or not in a dictionary.
c) Write a Python script to concatenate following dictionaries to create a new one.
   Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}
   Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
d) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
e) Write a Python program to map two lists into a dictionary.

Module 5: Exercise Programs on functions and recursion.

a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between given range X and Y.
c) Define functions to find mean, median, mode for the given numbers in a list.
d) Define a function which generates Fibonacci series up to n numbers.
e) Implement a python script for factorial of number by using recursion.
f) Implement a python script to find GCD of given two numbers using recursion.

Module 6: Exercise programs on Strings

a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.
c) Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
d) Implement python script that takes a list of words and returns the length of the longest one.

Module 7: Exercise programs on Regular Expressions

a) Write a Python script to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9).
b) Write a Python script to check whether password is valid or not.

   Conditions for a valid password are:
   Should have at least one number.
   Should have at least one uppercase and one lowercase character.
   Should have at least one special symbol.
   Should be between 6 to 20 characters long.

Module 8: Exercise programs on Matplotlib Library

a) Write a Python program to draw a line with suitable label in the x axis, y axis and a title.
b) Write a Python program to plot two or more lines with legends, different widths and colors.
c) Write a Python program to create multiple plots.
d) Write a Python programming to display a bar chart using different color for each bar.
e) Write a Python programming to create a pie chart with a title.
f) Write a Python program to draw a scatter plot with empty circles taking a random distribution in X and Y and plotted against each other.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Language Basics and Example Programs	3	06-01-2024		TLM4	CO1,CO4	
2.	Language Basics and Example Programs	3	11-01-2024		TLM4	CO1,CO4	
3.	Language Basics and Example Programs	3	20-01-2024		TLM4	CO2,CO4	
4.	Module-1 Programs on Lists	3	27-01-2024		TLM4	CO2,CO4	
5.	Module-1 Programs on Lists	3	03-02-2024		TLM4	CO2,CO4	
6.	Module-2 Programs on Tuples	3	10-02-2024		TLM4	CO2,CO4	
7.	Module-3 & 4 Programs on Sets Programs on Dictionaries	3	17-02-2024		TLM4	CO3,CO4	
8.	Module-4 Programs on Dictionaries	3	24-02-2024		TLM4	CO3,CO4	
9.	Module-5 Programs on Functions & Recursions	3	09-03-2024		TLM4	CO3,CO4	
10.	Module-6 Programs on Strings	3	16-03-2024		TLM4	CO3,CO4	
11.	Module-7 Programs on Regular Expressions	3	23-03-2024		TLM4	All CO's	
12.	Module-8 Programs on Matplotlib	3	30-03-2024		TLM4	All CO's	
13.	Revision	3	06-04-2024		TLM4	All CO's	
14.	Internal Lab Exam	3	13-04-2024		TLM4	All CO's	

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

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:** The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:** To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:** The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mrs.T.Hima Bindu Mrs.G.Tabita,	Mrs.G.Tabita	Dr.Y.V.Bhaskar Reddy	Dr.J.Siva Vara Prasad

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.G.Tabita , Mrs.T.Hima Bindu
Course Name & Code : Programming Using Python Lab(20AD53)
L-T-P Structure : 1-0-2 Credits : 2
Program/Sem/Sec : B.Tech.(EEE) IV-Sem., B A.Y: 2023-24

PRE-REQUISITE:C Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO 1	Identify various programming constructs available in Python and apply them in solving computational problems. (Applying - L3)
CO 2	Demonstrate data structures available in Python and apply them in solving computational problems. (Applying - L3)
CO 3	Implement modular programming, string manipulations and Python Libraries (Applying - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values. (Applying - 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	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	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).

PART-B

Introduction: Language basics and example problems

a) Implement Python Script for checking the given year is leap year or not.
b) Implement Python Script for finding biggest number among 3 numbers.
c) Implement Python Script for displaying reversal of a number.
d) Implement Python Script to check given number is Armstrong or not.
e) Implement Python Script to print sum of N natural numbers.
f) Implement Python Script to check given number is palindrome or not.
g) Implement Python script to print factorial of a number.
h) Implement Python Script to print all prime numbers within the given range.
i) Implement Python Script to calculate the series: $S=1+x^1+x^2+x^3+.....x^n$
j) Implement Python Script to print the following pattern:

```
*
*   *
*   *   *
```

Modue 1: Exercise Programs on Lists.

a) Write a Python script to display elements of list in reverse order.
b) Write a Python script to find the minimum and maximum elements without using built-in operations in the lists.
c) Write a Python script to remove duplicates from a list.
d) Write a Python script to append a list to the second list.
e) Write a Python script to count the number of strings in a list where the string length is 2 or more.

Module 2: Exercise Programs on Tuples.

a) Write a Python script to create a tuple with different data types.
b) Write a Python script to find the repeated items of a tuple.
c) Write a Python script to replace last value of tuples in a list.
   Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]
   Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]
d) Write a Python script to sort a tuple by its float element.
   Sample data: [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]
   Expected Output: [('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]

Module 3: Exercise Programs on Sets.

a) Write a Python script to add member(s) in a set.
b) Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.

c) Write Python script to test whether every element in S is in T and every element in T is in S.

Module 4: Exercise Programs on Dictionaries

a) Write a Python script to sort (ascending and descending) a dictionary by value.
b) Write a Python script to check whether a given key already exists or not in a dictionary.
c) Write a Python script to concatenate following dictionaries to create a new one.
   Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}
   Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
d) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
e) Write a Python program to map two lists into a dictionary.

Module 5: Exercise Programs on functions and recursion.

a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between given range X and Y.
c) Define functions to find mean, median, mode for the given numbers in a list.
d) Define a function which generates Fibonacci series up to n numbers.
e) Implement a python script for factorial of number by using recursion.
f) Implement a python script to find GCD of given two numbers using recursion.

Module 6: Exercise programs on Strings

a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.
c) Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
d) Implement python script that takes a list of words and returns the length of the longest one.

Module 7: Exercise programs on Regular Expressions

a) Write a Python script to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9).
b) Write a Python script to check whether password is valid or not.

   Conditions for a valid password are:
   Should have at least one number.
   Should have at least one uppercase and one lowercase character.
   Should have at least one special symbol.
   Should be between 6 to 20 characters long.

Module 8: Exercise programs on Matplotlib Library

a) Write a Python program to draw a line with suitable label in the x axis, y axis and a title.
b) Write a Python program to plot two or more lines with legends, different widths and colors.
c) Write a Python program to create multiple plots.
d) Write a Python programming to display a bar chart using different color for each bar.
e) Write a Python programming to create a pie chart with a title.
f) Write a Python program to draw a scatter plot with empty circles taking a random distribution in X and Y and plotted against each other.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Language Basics and Example Programs	3	04-01-2024		TLM4	CO1,CO4	
2.	Language Basics and Example Programs	3	11-01-2024		TLM4	CO1,CO4	
3.	Language Basics and Example Programs	3	18-01-2024		TLM4	CO2,CO4	
4.	Module-1 Programs on Lists	3	25-01-2024		TLM4	CO2,CO4	
5.	Module-1 Programs on Lists	3	01-02-2024		TLM4	CO2,CO4	
6.	Module-2 Programs on Tuples	3	08-02-2024		TLM4	CO2,CO4	
7.	Module-3 & 4 Programs on Sets Programs on Dictionaries	3	15-02-2024		TLM4	CO3,CO4	
8.	Module-4 Programs on Dictionaries	3	22-02-2024		TLM4	CO3,CO4	
9.	Module-5 Programs on Functions & Recursions	3	07-03-2024		TLM4	CO3,CO4	
10.	Module-6 Programs on Strings	3	14-03-2024		TLM4	CO3,CO4	
11.	Module-7 Programs on Regular Expressions	3	21-03-2024		TLM4	All CO's	
12.	Module-8 Programs on Matplotlib	3	28-03-2024		TLM4	All CO's	
13.	Revision	3	04-04-2024		TLM4	All CO's	
14.	Internal Lab Exam	3	11-04-2024		TLM4	All CO's	

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

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:** The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:** To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:** The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mrs.G.Tabita, Mrs.T.Hima Bindu	Mrs.G.Tabita,	Dr.Y.V.Bhaskar Reddy	Dr.J.Siva Vara Prasad

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.Imran Abdul,Mr.P.Srihari
Course Name & Code **:** ANALOG ELECTRONICS LAB & 20EE56
L-T-P Structure **: 0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/IV/A **A.Y.:**2023-24

Pre requisite: Electronic Circuits and Devices and Analog Electronics.
Course Educational Objective: This course provides the practical exposure on designing of different single stage and multistage stage amplifiers, effect of capacitances on frequency response, analysis of power and feedback amplifiers.

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

CO1	Demonstrate the characteristics of Amplifiers, Oscillators, feedback amplifiers, and Multivibrators.**(Apply-L3)**
CO2	Analyze Timer circuits and its applications.**(Apply-L3)**
CO3	Design of feedback amplifiers, Power amplifiers and waveform generators using Electronic devices and components.**(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	
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																

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

DAY : Monday
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	8/1/24	22/1/24	29/1/24	5/2/24	12/2/24	19/2/24	4/3/24	11/3/24	18/3/24	1/4/24	8/4/24	15/4/24	22/4/24
	Actual date													
B-1	20761A0252 21761A0245-22761A0201	DEMO	1	2	3	4	5	6	7	8	9	10	REVISON OF EXPERIMENTS	INTERNAL EXAM
B-2	22761A0202-22761A0204	DEMO	1	2	3	4	5	6	7	8	9	10		
B-3	22761A0205-22761A0207	DEMO	1	2	3	4	5	6	7	8	9	10		
B-4	22761A0208-22761A0210	DEMO	1	2	3	4	5	6	7	8	9	10		
B-5	22761A0211-22761A0213	DEMO	1	2	3	4	5	6	7	8	9	10		
B-6	22761A0214-22761A0218	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	22761A0219-22761A0222	DEMO	1	2	3	4	5	6	7	8	9	10		
B-8	22761A0223-22761A0226	DEMO	1	2	3	4	5	6	7	8	9	10		
B-9	22761A0227-22761A0230	DEMO	1	2	3	4	5	6	7	8	9	10		
B-10	22761A0231-22761A0234	DEMO	1	2	3	4	5	6	7	8	9	10		

DAY : Wednesday
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	10/1/24	24/1/24	31/1/24	7/2/24	14/2/24	21/2/24	6/3/24	13/3/24	20/3/24	27/3/24	3/4/24	10/4/24	24/4/24
	Actual date													
B-1	22761A0235-22761A0237	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	22761A0238-22761A0240	DEMO	1	2	3	4	5	6	7	8	9	10		
B-3	22761A0241-22761A0243	DEMO	1	2	3	4	5	6	7	8	9	10		
B-4	22761A0244-22761A0246	DEMO	1	2	3	4	5	6	7	8	9	10		
B-5	22761A0247-22761A0249	DEMO	1	2	3	4	5	6	7	8	9	10		
B-6	22761A0250-22761A0253	DEMO	1	2	3	4	5	6	7	8	9	10		
B-7	22761A0254-22761A0255 23765A0201-23765A0202	DEMO	1	2	3	4	5	6	7	8	9	10		
B-8	23765A0204-23765A0207	DEMO	1	2	3	4	5	6	7	8	9	10		
B-9	23765A0208-23765A0211	DEMO	1	2	3	4	5	6	7	8	9	10		
B-10	23765A0212-23765A0215	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.

Mr.Imran Abdul Mr.P,Srihari	Mr.A.V Ravi Kumar	Dr.AVGA Marthanda	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: Mr. A.V. Ravikumar / Mrs.T.Naga Durga/ Mr.V.Prabhakar Reddy
Course Name & Code **:** ANALOG ELECTRONICS LAB & 20EE56
L-T-P Structure **: 0-0-2** **Credits: 1**
Program/Sem/Sec : B.Tech/IV/B **A.Y.:** 2022-23

Pre requisite: Electronic Circuits and Devices and Analog Electronics.
Course Educational Objective: This course provides the practical exposure on designing of different single stage and multistage stage amplifiers, effect of capacitances on frequency response, analysis of power and feedback amplifiers.

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

CO1	Demonstrate the characteristics of Amplifiers, Oscillators, feedback amplifiers, and Multivibrators.**(Apply-L3)**
CO2	Analyze Timer circuits and its applications.**(Apply-L3)**
CO3	Design of feedback amplifiers, Power amplifiers and waveform generators using Electronic devices and components.**(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	
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																

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

DAY : TUESDAY
Batches : 21761A0249 – 280

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week	XVI Week	XVII Week
	Tentative date	31/01	07/02	14/02	21/02	28/02	07/03	14/03	21/03	04/04	11/04	18/04	25/04	02/05	09/05	16/05	23/05	30/05
	Actual date																	
B-1	21761A0249 21761A0250 21761A0251	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-2	21761A0252 21761A0253 21761A0254	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-3	21761A0255 21761A0256 21761A0257	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-4	21761A0258 21761A0260 21761A0261	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-5	21761A0262 21761A0263 21761A0264	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-6	21761A0265 21761A0266 21761A0267	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	21761A0268 21761A0269 21761A0270	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-8	21761A0272 21761A0273 21761A0274	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-9	21761A0275 21761A0276 21761A0277	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					
B-10	21761A0278 21761A0279 21761A0280	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10					

DAY : FRIDAY

Batches : 21761A0281 – 294 & 22765A0215 – 228, 20-278

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	03/02	10/02	17/02	24/02	03/03	10/03	17/03	24/03	21/04	28/04	05/05	12/05	19/05	26/05	02/06
	Actual date															
B-1	21761A0281 21761A0282 21761A0283	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	**INTERNAL EXAM**
B-2	21761A0284 21761A0285 21761A0286	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-3	21761A0287 21761A0288 21761A0289	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-4	21761A0290 21761A0291 21761A0292	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-5	21761A0293 21761A0294 22765A0215	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-6	22765A0216 22765A0217 22765A0218	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-7	22765A0219 22765A0220 22765A0221	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-8	22765A0222 22765A0223 22765A0224	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-9	22765A0225 22765A0226 22765A0227	DEMO	DEMO	1	2	3	4	5	6	7	8	9	10			
B-10	22765A0228 20761A0278	DEMO	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.

Mr.A.V.Ravikumar Mrs.T.Naga Durga Mr.V.Prabhakar Reddy	Mr.R.Anjaneyulu Naik	Dr A V G A MARTHANDA	Dr.J.S.V.PRASAD
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.T.Nagadurga,Mr.J.V.PavanChand
Course Name & Code : ELECTRICAL MACHINES-I LAB & 20EE57
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/IV/A **A.Y.:**2023-24

PRE-REQUISITES : Applied Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student toanalyze the operation of dc machines and transformers, Give practical exposure on the performance of DC machines and transformers.

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

CO1	Analyze the performance of DC generators **(Apply-L3)**
CO2	Examine the performance of DC motors by conducting different tests **(Apply-L3)**
CO3	Analyze the performance of transformers **(Apply-L3)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSOa	PSOb	PSOc	PSOd
CO1	2	2	2	2	2			2	2	2			2			3
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																

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

DAY : Monday
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	**8/1/24**	**22/1/24**	**29/1/24**	**5/2/24**	**12/2/24**	**19/2/24**	**4/3/24**	**11/3/24**	**18/3/24**	**1/4/24**	**8/4/24**	**15/4/24**	**22/4/24**
	Actual date													
B-1		DEMO	1	2	3	4	5	6	7	8	9	10	REVISON 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 : Wednesday
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	10/1/24	24/1/24	31/1/24	7/2/24	14/2/24	21/2/24	6/3/24	13/3/24	20/3/24	27/3/24	3/4/24	10/4/24	24/4/24
	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.
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	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.T.Nagadurga Mr.J.V.Pavanchand	Dr.T.Nagadurga	Mr.P. Deepak Reddy	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 Mr.J.V.PavanChand, Mrs. R.Padma
Course Name & Code : ELECTRICAL MACHINES-I LAB & 20EE57
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Sem/Sec : B.Tech/IV/B **A.Y.:**2023-24

PRE-REQUISITES: Applied Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to analyze the operation of dc machines and transformers, Give practical exposure on the performance of DC machines and transformers.

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

CO1	Analyze the performance of DC generators **(Apply-L3)**
CO2	Examine the performance of DC motors by conducting different tests **(Apply-L3)**
CO3	Analyze the performance of transformers **(Apply-L3)**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSOa	PSOb	PSOc	PSOd
CO1	2	2	2	2	2			2	2	2			2			3
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																

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
	Tentative date	**9/1/24**	**23/1/24**	**30/1**	**6/2/24**	**13/2**	**20/2**	**5/3/24**	**12/3**	**19/3**	**26/3**	**2/4/24**	**16/4**	**23/4**
	Actual date													
B-1		DEMO	1	2	3	4	5	6	7	8	9	10	REVISON 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: Saturday
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	20/1/24	27/1	3/2/24	17/2	24/2	16/3	23/3	30/3	6/4	20/4	27/4	27/4	
	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.
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PROGRAMME OUTCOMES (POs):

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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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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.
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PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Mr.J.V.Pavanchand Mrs R.Padma	Dr.T.Nagadurga	Mr.P. Deepak Reddy	Dr.J.Sivavara Prasad
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

PART-A

Name of Course Instructor: Mr.Y.Raghuvamsi /Mr.K.Nagalinga chary
Course Name & Code : SOC-II (PLC Based Industrial Automation)- 20EES2
L-T-P Structure : **1-0-2** **Credits: 2**
Program/Sem/Sec : B.Tech/IV/A **A.Y.:** 2023-24

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

DAY : FRIDAY
Batches : 20-252,21-245,22-201 to 22-255 & 23765A0201 to 23765A0215

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	05/1/24	12/1/24	19/1/24	02/2/24	09/2/24	16/2/24	23/2/24	15/3/24	22/3/24	05/4/24	12/4/24	19/4/24	26/4/24
	Actual date													
B-1	20761A0252, 21761A0245, 22761A0201 to 22761A0255 & 23765A0201 to 23765A0215	1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-2		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-3		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-4		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-5		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-6		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-7		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-8		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-9		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-10		1,2	3,4	5,6	7,8	9,10	Value Added Course							

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	Marks
Semester End Examination (SEE)	50
Total Marks = SEE	50

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Mr.Y.Raghuvamsi Mr.K.Nagalinga Chary	Mr.K.Nagalinga Chary		Dr.J.Sivavara Prasad
Course Instructor	Course Coordinator	Module Coordinator	HOD

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Nagalinga chary / Mr.Y.Raghuvamsi
Course Name & Code **:** SOC-II (PLC Based Industrial Automation)- 20EES2
L-T-P Structure **: 1-0-2** **Credits: 2**
Program/Sem/Sec : B.Tech/IV/B **A.Y.:** 2023-24

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

DAY: Monday
Batches: 20-278,22-256 to 22-2A9 & 23765A0216 to 23765A0230

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date	08/1/24	22/1/24	29/1/24	05/2/24	12/2/24	19/2/24	04/3/24	11/3/24	18/3/24	01/4/24	08/4/24	15/4/24	22/4/24
	Actual date													
B-1	20761A0278, 22761A0256 to 22761A02A9 & 23765A0216 to 23765A0230	1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-2		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-3		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-4		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-5		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-6		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-7		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-8		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-9		1,2	3,4	5,6	7,8	9,10	Value Added Course							
B-10		1,2	3,4	5,6	7,8	9,10	Value Added Course							

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	Marks
Semester End Examination (SEE)	50
Total Marks = 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.
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PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

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

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PSO 2	Design and analyze electrical machines, modern drive and lighting systems
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PSO4	Design controllers for electrical and electronic systems to improve their performance.

Mr.K.Nagalinga Chary Mr.Y.Raghuvamsi	Mr.K.Nagalinga Chary		Dr.J.Sivavara Prasad
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : P.RAJASEKHAR
Course Name & Code :Introduction to Database Systems-20CSM4
L-T-P Structure : 3-1-0 Credits : 4
Program/Sem/Sec : B.Tech., EEE&ECE., IV-Sem., Sections- ALL A.Y: 2023-24

PRE-REQUISITE: Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the students to know about Basic concepts of DBMS, Database Languages, Database Design, Normalization Process, Transaction Processing, and Indexing.

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

CO1	Outline the components of DBMS & design database using ER model
CO2	Construct database using SQL and extract data from database using Relational algebra & SQL queries.
CO3	Apply the normalization process for effective database design
CO4	Analyze components of transaction processing, Concurrency control mechanisms and recovery strategies of DBMS
CO5	Evaluate different File organization & Indexing Techniques

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO2	3	3	-	-	1	-	-	-	-	-	-	-	2	3	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	3	-
CO4	2	1	2	-	-	-	-	-	-	-	-	-	1	3	-
CO5	2	1	2	-	-	-	-	-	-	-	-	-	1	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 Henry F. Korth, Abraham Silberschatz, S.Sudarshan, "Database System Concepts", McGraw Hill, 6 thedition, 2009.

T2 RamezElmasri, ShamkanthB.Navathe, "Fundamentals of Database Systems", Addison Wesley, 6 thedition, 2010.

REFERENCE BOOKS:

R1 Raghu Ramakrishnan, JohanneseGehrke, "Database Management System", McGraw Hill, 3 rd edition, 2000.

R2 Date C J, "An Introduction to Database System", Pearson Education, 8th edition, 2003

R3 Sharad Maheshwari, Ruchin Jain, "DBMS: Complete Practical Approach", Firewall Media, New Delhi, 2005

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT –I: Introduction & Data modeling using the Entity Relationship Model

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction, An overview of database management system	1	08-01-2024		**TLM1**	CO1	T1,T2,R1	
2.	Database system Vs file system	1	10-01-2024		**TLM1**	CO1	T1,T2,R1	
3.	Database system concepts and architecture	1	12-01-2024		**TLM1**	CO1	T1,T2,R1	
4.	Data models schema and instances	1	19-01-2024		**TLM1**	CO1	T1,T2,R1	
5.	Data independence and data base language and interfaces	1	22-01-2024		**TLM1**	CO1	T1,T2,R1	
6.	Data definitions language, DML, Overall Database Structure	1	24-01-2024		**TLM1**	CO1	T1,T2,R1	
7.	**Assignment/ Tutorial – I**	1	29-01-2024		**TLM3**	CO1		

8.	ER model concepts- notation for ER diagram	1	31-01-2024		**TLM1/ TLM2**	CO1	T1,T2,R1	
9.	Mapping constraints, keys	1	02-02-2024		**TLM1**	CO1	T1,T2,R1	
10.	Concepts of Super Key, candidate key, primary key, Generalization, aggregation	1	05-02-2024		**TLM1**	CO1	T1,T2,R1	
11.	Reduction of an ER diagrams to tables, Extended ER model, Relationships of higher degree	1	07-02-2024		**TLM1/ TLM2**	CO1	T1,T2,R1	
12.	**Assignment/ Tutorial – II**	1	09-02-2024		**TLM3**	CO1		
No. of classes required to complete UNIT-I		12			No. of classes taken:12			

UNIT –II: Relational data Model and Language & Introduction to SQL

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Relational data model concepts	1	12-02-2024		**TLM1**	CO2	T1,T2,R1	
14.	Integrity constraints: entity integrity, referential integrity	1	12-02-2024		**TLM1**	CO2	T1,T2,R1	
15.	Keys constraints, Domain constraints	1	12-02-2024		**TLM1**	CO2	T1,T2,R1	
16.	Relational algebra	1	12-02-2024		**TLM1**	CO2	T1,T2,R1	
17.	Tutorial – III	1	14-02-2024		**TLM3**	CO2		
18.	Characteristics of SQL, Advantage of SQL	1	14-02-2024		**TLM1**	CO2	T1,T2,R1	
19.	SQL data types and literals, Types of SQL commands	1	14-02-2024		**TLM1**	CO2	T1,T2,R1	
20.	SQL operators and their procedure	1	16-02-2024		**TLM1**	CO2	T1,T2,R1	

21.	Tables, views and indexes,	1	16-02-2024		**TLM1**	CO2	T1,T2,R1	
22.	Queries and sub queries, Aggregate functions	1	16-02-2024		**TLM1/ TLM2**	CO2	T1,T2,R1	
23.	Insert, update and delete operations	1	19-02-2024		**TLM1**	CO2	T1,T2,R1	
24.	Unions, Intersection, Minus, Cursors in SQL	1	19-02-2024		**TLM1**	CO2	T1,T2,R1	
25.	Tutorial – IV	1	21-02-2024		**TLM3**	CO2		
No. of classes required to complete **UNIT-2**		13			No. of classes taken:			

UNIT –III: Normalization

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Functional Dependencies	1	21-02-2024		**TLM1**	CO3	T1,T2,R1	
27.	Normal Forms: First, Second	1	21-02-2024			CO3	T1,T2,R1	
28.	Third Normal Forms	1	23-02-2024			CO3	T1,T2,R1	
29.	BCNF, Inclusion Dependences	1	23-02-2024			CO3	T1,T2,R1	
30.	LossLess Join Decompositions	1	23-02-2024			CO3	T1,T2,R1	
31.	Tutorial – V	1	04-03-2024		**TLM3**			
32.	Normalization Using FD,MVD	1	06-03-2024		**TLM1**	CO3	T1,T2,R1	
33.	Normalization Using JD	1	11-03-2024		**TLM1**	CO3	T1,T2,R1	
34.	Alternative Approaches To Database Design	1	13-03-2024		**TLM1**	CO3	T1,T2,R1	
35.	Tutorial – VI	1	13-03-2024		**TLM3**	CO3		
No. of classes required to complete **UNIT-3**		10			No. of classes taken:			

UNIT –IV: Transaction Processing Concepts &Concurrency Control techniques

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
36.	Transaction System	1	15-03-2024		**TLM1**	CO4	T1,T2,R1	
37.	Testing Of Serializability	1	15-03-2024		**TLM1**	CO4	T1,T2,R1	
38.	Serializability Of Schedules	1	18-03-2024		**TLM1**	CO4	T1,T2,R1	
39.	Conflict & View Serializable Schedule	1	20-03-2024		**TLM1**	CO4	T1,T2,R1	
40.	Recoverability, Log Based Recovery, Checkpoints,	1	22-03-2024		**TLM1**	CO4	T1,T2,R1	
41.	ARIES Algorithm, Deadlock Handling	1	22-03-2024		**TLM1/ TLM2**	CO4	T1,T2,R1	
42.	Tutorial –VII	1	27-03-2024		**TLM3**			
43.	Concurrency Control	1	27-03-2024		**TLM1**	CO4	T1,T2,R1	
44.	Techniques For Concurrency Control	1	01-04-2024		**TLM1**	CO4	T1,T2,R1	
45.	Time Stamping Protocols For Concurrency Control	1	03-04-2024		**TLM1**	CO4	T1,T2,R1	
46.	Locking, Validation Based Protocol	1	08-04-2024		**TLM1**	CO4	T1,T2,R1	
47.	Multiple Granularity	1	10-04-2024		**TLM1**	CO4	T1,T2,R1	
48.	Recovery With Concurrent Transactions	1	12-04-2024		**TLM1/ TLM2**	CO4	T1,T2,R1	
49.	Tutorial-IV		15-04-2024		**TLM3**	CO4		
No. of classes required to		14			No. of classes taken:			

complete **UNIT-4**				

UNIT-V: Storage and Indexing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50.	RAID Levels	1	19-04-2024		**TLM1**	CO5	T1,T2,R1	
51.	Page Formats	1	22-04-2024		**TLM1**	CO5	T1,T2,R1	
52.	Record Formats	1	22-04-2024		**TLM1**	CO5	T1,T2,R1	
53.	File Types And Organization, Tutorial – IX	1	24-04-2024 24-04-2024 24-04-2024		**TLM1/ TLM3**	CO5	T1,T2,R1	
54.	ISAM	1	24-04-2024		**TLM1/ TLM2**	CO5	T1,T2,R1	
55.	B-Tree	1	26-04-2024		**TLM1**	CO5	T1,T2,R1	
56.	B+-Tree	1	26-04-2024		**TLM1/ TLM2**	CO5	T1,T2,R1	
57.	Tutorial – X	1	26-04-2024		**TLM3**	CO5		
No. of classes required to complete **UNIT-5**		08			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	CODD RULES	1	26-04-2024		**TLM1**	CO1-CO5	T1,T2,R1	

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

PART-C

EVALUATION PROCESS (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	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.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
P.Rajasekhar	P.Rajasekhar	P.Rajasekhar	D.Veeraaiah

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs.S.JYOTHI
Course Name & Code : LINUX ESSENTIALS, 20ITM1
L-T-P Structure : **3-1-0** **Credits:** 4
Program/Sem/Sec : B.Tech, IV/ Minors **A.Y.:** 2023-24

PREREQUISITE : NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course meant for the students who want to build their career in Linux System Administration domain. The student who completed this course possesses the fundamental knowledge and proven skills in the area of Linux Essentials.

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

CO1	Demonstrate Linux Utilities. (Knowledge-L1)
CO2	Identify the Basics of using the Linux command line (Understanding- L2)
CO3	Create, Search and extract data from files in the home directory. (Apply- L3)
CO4	Familiarity in working with hardware components, server computers, networking configuration. (Understand- L2)
CO5	Understanding and manipulating file permissions and ownership settings. (Knowledge-L1)

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

TEXT BOOKS:

1. Linux Essentials, 2nd Edition, Author: Christine Bresnahan , Publisher: Sybex

REFERENCE BOOKS:

1. Linux Pocket Guide: Essential Commands Linux Pocket Guide is a book written by Jason Cannon. It provides an organized...
2. The Linux Command Line The Linux Command Line is a book written by William Shotts. The author takes you from your...
3. Linux for Beginners: An Introduction to the Linux Operating System and Command Line Linux for Beginners is a book...
4. Linux Command Line and Shell Scripting Bible, 3rd Edition Linux Command Line and Shell Scripting Bible is a reference...

E-BOOKS AND ONLINE COURSE MATERIALS:

1. Linux Essentials by CISCO Academy

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: The Linux Community and a Career in Open Source.

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, CO's and PO's	1	03/01/24		TLM-1	
2.	Linux Evolution	1	05/01/24		TLM-1	
3.	Popular Operating Systems	1	05/01/24		TLM-2	
4.	Major Open Source Applications	2	08/01/24& 10/01/24		TLM-2	
5.	Open Source Software and Licensing	1	12/01/24		TLM-2	
6.	ICT Skills	1	12/01/24		TLM-1	
7.	Working in Linux	1	19/01/24		TLM-1	
8.	**Tutorial**	2	22/01/24& 24/01/24		TLM-3	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Finding Your Way on a Linux System.

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Command Line Basics,	1	29/01/24		TLM-1	
10.	Running help commands	1	31/01/24		TLM-1	
11.	navigation of the various help systems	2	02/02/24		TLM-1	
12.	Using Directories and Listing Files,	2	05/02/24& 07/02/24		TLM-1	
13.	Creating, Moving and Deleting Files	2	09/02/24		TLM-2	
14.	**Tutorial**	2	12/02/24& 14/02/24		TLM-3	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: The Power of the Command Line.

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Archiving Files on the Command Line,	3	16/02/24& 19/02/24		TLM-1	
16.	Searching and Extracting Data from Files,	3	21/02/24& 23/02/24		TLM-1	
17.	Turning Commands into a Script.	3	23/02/24& 04/03/24		TLM-1	
18.	**Tutorial**	2	06/03/24& 11/03/24		TLM-3	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: The Linux Operating System.

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.	GUI versus command line,	1	13/03/24		TLM-2	
20.	desktop configuration	1	15/03/24		TLM-2	
21.	Maintenance cycles	1	15/03/24		TLM-2	
22.	beta and stable	1	18/03/24		TLM-1	
23.	Motherboards, processors, power supplies, optical drives, peripherals	2	20/03/24& 22/03/24		TLM-1	
24.	Hard drives, solid state disks and partitions	1	22/03/24		TLM-1	
25.	Drivers	1	27/03/24		TLM-1	
26.	**Tutorial**	2	01/04/24& 03/04/24		TLM-3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Security and File Permissions.

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.	Basic Security	1	08/04/24		TLM-2	
28.	Identifying User Types	1	10/04/24		TLM-1	
29.	Creating Users and Groups,	2	12/04/24		TLM-1	
30.	Managing File Permissions	1	15/04/24		TLM-1	
31.	Ownership	2	19/04/24		TLM-1	
32.	Special Directories and Files	1	22/04/24		TLM-1	
33.	**Tutorial**	1	26/04/24		TLM-3	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond The Syllabus:

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 Linux System Architecture	2	24/04/24		TLM-2	
No. of classes required to complete :2				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Organize, Analyze and Interpret the data to extract meaningful conclusions
PSO 2	Design, Implement and evaluate a computer-based system to meet desired needs
PSO 3	Develop IT application services with the help of different current engineering tools

	Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Signature				
Name of the Faculty	Mrs.S.Jyothi	Mrs.S.Jyothi	Mr.G.Rajendra	Dr. B.Srinivasa Rao