K.L.N. COLLEGE OF ENGINEERING

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Autonomous Regulation - 2020

B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

I - VIII SEMESTERS CURRICULUM

S NO	Semester	COURSE CODE	COURSE TITLE
1	I	20HS101	English for Technical Communication
2		20BS101	Fundamentals of Engineering Mathematics
3		20BS102	Engineering Physics
4		20BS103	Engineering Chemistry
5		20GE101	Problem Solving using Python Programming
6		20BS1L1	Basic Science Laboratory
7		20GE1L1	Python Programming Laboratory
8		20GE1L2	Industrial Practices workshop
9	III	20BS301	Transforms and Partial Differential Equations
10		20EE301	Digital Logic Circuits
11		20EE302	Electron Devices and Circuits
12		20EE303	Electromagnetic Theory
13		20EE304	Electrical Machines – I
14		20HS301	Universal Human Values
15		20EE3L1	Electronics Laboratory
16		20EE3L2	Electrical Machines Laboratory – I
17	V	20EE501	Power System Analysis
18		20EE502	Power Electronics
19		20EE503	Digital Signal Processing
20		20EE504	Control Systems
21		20EE505*	Microprocessors, Microcontrollers and Applications
22			**Open Elective -I**
23		20MC501	Constitution of India
24		20EE5L1	Control and Instrumentation Laboratory
25		20EE5L2*	Microprocessors and Microcontrollers Laboratory
26		20HS4L2	Professional Communication Laboratory
27	VII	20EE701	Protection and Switchgear
28		20EE702	Renewable Energy Systems
29			**Open Elective II**
30			**Professional Elective III - Group-A**
31			**Professional Elective-IV - Group-B**
32		20EE7L1	Power System Simulation Laboratory
33		20EE7L2	Renewable Energy Systems Laboratory

S NO	Semester	COURSE CODE	COURSE TITLE
35	II	20HS201	Advanced Technical Communication
36		20BS201	Laplace Transform and advanced calculus
37		20BS203	Physics for Electronics Engineering (Common to EEE, ECE and EIE)
38		20CS201	Programming in C (Common to EEE, EIE, CSE and IT)
39		20EE201	Electric Circuit Analysis
40		20GE201	Engineering Graphics
41		20CS2L1	C Programming Laboratory
42		20EE2L2	Electric Circuits Laboratory
43	IV	20BS402	Numerical Methods
44		20EE401	Electrical Machines – II
45		20EE402	Transmission and Distribution
46		20EE403	Linear Integrated Circuits and Applications
47		20EE404	Measurements and Instrumentation
48		20HS401	Environmental Science and Engineering
49		20EE4L1	Electrical Machines Laboratory – II
50		20EE4L2	Linear and Digital Integrated Circuits Laboratory
51		20EE4L3	Technical Seminar
52	VI	20EE601	Solid State Drives
53		20EE602	Power System Operation and Control
54		20IT301	Object Oriented Programming
55		20EE603	Embedded Systems
56			**Professional Elective I - Group- A**
57			**Professional Elective II - Group-B**
58		20MC601	Essence of Indian Traditional knowledge
59		20EE6L1	Power Electronics and Drives Laboratory
60		20CS6L3	Object Oriented and JAVA Programming Laboratory
61		20EE6P1	Mini Project
62	VIII		**Professional Elective –V - Group- A**
63			**Professional Elective VI - Group- B**
64		20EE8P1	Project Work

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INDEX OF I - VIII SEMESTERS CURRICULUM

S NO	Index	COURSE CODE	COURSE TITLE
		Semester - I	
1	C101	20HS101	English for Technical Communication
2	C102	20BS101	Fundamentals of Engineering Mathematics
3	C103	20BS102	Engineering Physics
4	C104	20BS103	Engineering Chemistry
5	C105	20GE101	Problem Solving using Python Programming
6	C106	20BS1L1	Basic Science Laboratory
7	C107	20GE1L1	Python Programming Laboratory
8	C108	20GE1L2	Industrial Practices workshop
		Semester - III	
9	C201	20BS301	Transforms and Partial Differential Equations
10	C202	20EE301	Digital Logic Circuits
11	C203	20EE302	Electron Devices and Circuits
12	C204	20EE303	Electromagnetic Theory
13	C205	20EE304	Electrical Machines – I
14	C206	20HS301	Universal Human Values
15	C207	20EE3L1	Electronics Laboratory
16	C208	20EE3L2	Electrical Machines Laboratory – I
		Semester - V	
17	C301	20EE501	Power System Analysis
18	C302	20EE502	Power Electronics
19	C303	20EE503	Digital Signal Processing
20	C304	20EE504	Control Systems
21	C305	20EE505*	Microprocessors, Microcontrollers and Applications
22	C306		**Open Elective -I**
23	C307	20MC501	Constitution of India
24	C308	20EE5L1	Control and Instrumentation Laboratory
25	C309	20EE5L2*	Microprocessors and Microcontrollers Laboratory
26	C310	20HS4L2	Professional Communication Laboratory
		Semester - VII	
27	C401	20EE701	Protection and Switchgear
28	C402	20EE702	Renewable Energy Systems
29	C403		**Open Elective II**
30	C404		**Professional Elective III - Group-A**
31	C405		**Professional Elective-IV - Group-B**
32	C406	20EE7L1	Power System Simulation Laboratory
33	C407	20EE7L2	Renewable Energy Systems Laboratory

S NO	Index	COURSE CODE	COURSE TITLE
		Semester - II	
35	C109	20HS201	Advanced Technical Communication
36	C110	20BS201	Laplace Transforms and advanced calculus
37	C111	20BS203	Physics for Electronics Engineering (Common to EEE, ECE and EIE)
38	C112	20CS201	Programming in C (Common to EEE, EIE, CSE and IT)
39	C113	20EE201	Electric Circuit Analysis
40	C114	20GE201	Engineering Graphics
41	C115	20CS2L1	C Programming Laboratory
42	C116	20EE2L2	Electric Circuits Laboratory
		Semester - IV	
43	C209	20BS402	Numerical Methods
44	C210	20EE401	Electrical Machines – II
45	C211	20EE402	Transmission and Distribution
46	C212	20EE403	Linear Integrated Circuits and Applications
47	C213	20EE404	Measurements and Instrumentation
48	C214	20HS401	Environmental Science and Engineering
49	C215	20EE4L1	Electrical Machines Laboratory – II
50	C216	20EE4L2	Linear and Digital Integrated Circuits Laboratory
51	C217	20EE4L3	Technical Seminar
		Semester - VI	
52	C311	20EE601	Solid State Drives
53	C312	20EE602	Power System Operation and Control
54	C313	20IT301	Object Oriented Programming
55	C314	20EE603	Embedded Systems
56	C315		**Professional Elective I - Group- A**
57	C316		**Professional Elective II - Group-B**
58	C317	20MC601	Essence of Indian Traditional knowledge
59	C318	20EE6L1	Power Electronics and Drives Laboratory
60	C319	20CS6L3	Object Oriented and JAVA Programming Laboratory
61	C320	20EE6P1	Mini Project
		Semester - VIII	
62	C408		**Professional Elective –V - Group- A**
63	C409		**Professional Elective VI - Group- B**
64	C410	20EE8P1	Project Work

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VISION

To become a high standard of excellence in Education, Training and Research in the field of Electrical & Electronics Engineering and allied applications.

MISSION

To produce excellent, innovative and Nationalistic Engineers with Ethical Values and to advance in the field of Electrical & Electronics Engineering and allied areas.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Educational Objectives of the Electrical and Electronics Engineering (EEE) Programme represent major accomplishments that we expect our graduates to achieve after three to five years of graduation. More specifically our graduates are expected:

PEO1: to excel in industrial or graduate work in Electrical and Electronics Engineering and allied fields

PEO2: to practice their Professions conforming to Ethical Values and Environmentally friendly policies

PEO3: to work in international and multi-disciplinary Environments

PEO4: to successfully adapt to evolving Technologies and stay current with their Professions

PROGRAM OUTCOMES (POs)

Electrical and Electronics Engineering Graduates will be able to:

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 modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

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

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

Electrical and Electronics Engineering Graduates will be able to:

PSO1: Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits, analog and digital electronic circuits, electrical machines and power systems.

PSO2: Apply appropriate techniques and modern Engineering hardware and software tools in power systems to engage in life- long learning and to successfully adapt in multi disciplinary environments.

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

Course Outcomes - R-2020

C105	Course Name:	Problem Solving using Python Programming	Course Code :	20GE101

CO	Course Outcomes	Unit	K	POs	PSOs
C105.1	Explain Components of a Computer System, types of programming languages, types of software with examples and purpose.	I	K3	1,2	-
C105.2	Perform problem analysis, use algorithms and prepare flow charts, pseudo code for solving simple problems.	I	K3	1, 2	-
C105.3	Use Conditional, iteration constructs of python programming and apply to solve simple problems	II	K3	1, 2, 3	-
C105.4	Use Functions, recursive function, String functions in python programming and apply to perform linear and binary search	III	K3	1, 2, 3	-
C105.5	Explain the various operations for manipulating Tuples, Dictionaries and Use List toper form simple and sorting operations	IV	K3	1, 2, 3	-
C105.6	Explain file handling operations, exception handling, modules and packages and illustrate programs for word count, file copy, merge operations and exception handling.	V	K3	1, 2, 3	-

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C105.1	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C105.2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C105.3	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C105.4	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C105.5	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C105.6	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C105(Avg)	2.67	1.67	0.67	-	-	-	-	-	-	-	-	-	-	-
C105	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C105.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C105.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C105 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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C107	Course Name:	Python Programming Laboratory	Course Code :	20GE1L1

CO	Course Outcomes	K	POs	PSOs
C107.1	Develop simple Python programs using conditional and iterative constructs	K3	1,2,3,5	2
C107.2	Develop simple Python programs using built-in functions and user-defined functions	K3	1,2,3,5	2
C107.3	Develop a Python program using recursion to implement linear and binary search	K3	1,2,3,5	2
C107.4	Develop a Python program using list to implement selection and insertion sort	K3	1,2,3,5	2
C107.5	Develop Python programs to implement matrix operations	K3	1,2,3,5	2
C107.6	Develop a Python program to implement file handling	K3	1,2,3,5	2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C107.1	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.2	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.3	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.4	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.5	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.6	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107(Avg)	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107	1	1	2	-	3	-	-	-	-	-	-	-	-	1
C107.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C107.2,3,4	Assignment													

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C108	Course Name :	INDUSTRIAL PRACTICES LABORATORY	Course Code :	20GE1L2

CO	Course Outcomes	Exp. No	K	POs	PSOs
C108.1	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, CFL , LED Lamp etc.	1,2,3	K2	1,2,9	1,2
C108.2	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter.	4,5	K3	1,2,3,9	1,2
C108.3	Measure the resistance to earth of an electrical equipment, like Capacitor ,Inductor using LCR meter, Transistor & Diode – Terminal identification using Multimeter.	6,7	K3	1,2,3,9	1,2
C108.4	Experimentally to analyze AC signal parameters using CRO and AFO and verify the Truth tables of Logic gates AND, OR, EOR and NOT.	8,9	K4	1,2,3,4,9	1,2
C108.5	Experimentally to design a Simple circuit using soldering in a PCB, measure ripple factor of Half Wave Rectifier and Full Wave Rectifier	10,11	K4	1,2,3,4,9	1,2
C108.6	Experimentally to design the wiring circuit for single lamp controlled by single switch, Single lamp controlled by two switches, arrange the fuse incase of blows during short circuit in fuse holder and check the ac supply is available in power box with switch socket using tester.	1,2	K4	1,2,3,4,9	1,2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C108.1	2	1	-	-	-	-	-	-	**2#**	**-**	-	-	2	**1#**
C108.2	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C108.3	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C108.4	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C108.5	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C108.6	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**2#**
C108(Avg)	2.83	2.33	1.6	1	-	-	-	-	**2#**	-	-	-	2	**1.17#**
C108	3	2	2	1	-	-	-	-	**2#**	**-**	-	-	2	**1#**
C108.1#	**Assessment for PO9:**													
	Psychomotor (Skill) Domain - Imitation, Manipulation, Precision : Individual and team work (PO9)													

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C112	Course Name : Programming in C	Course Code :	20CS201

CO	Course Outcomes	Unit	K	POs	PSOs
C112.1	Use basic constructs of C programming to develop simple programs.	I	K2	1, 2, 3	2
C112.2	Analyze the one dimensional and two dimensional arrays and develop programs to implement operations such as addition, scaling, Determinant and Transpose.	II	K3	1, 2, 3	2
C112.3	Explain the string operations such as length, compare, concatenate and examine sorting and searching algorithm.	II	K2	1, 2, 3	2
C112.4	Illustrate the simple examples for functions and pointers and develop programs to implement pointer arithmetic, arrays with pointers and advanced concepts of functions.	III	K3	1, 2, 3	2
C112.5	Illustrate the simple programs for structures and unions and design real time application programs	IV	K3	1, 2, 3	2
C112.6	Construct the file operations and develop programs to implement various file access procedures.	V	K3	1, 2, 3	2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C112.1	2	1	-	-	-	-	-	-	-	-	-	-	-	**1**
C112.2	3	2	1	-	-	-	-	-	-	-	-	-	-	1
C112.3	2	1	-	-	-	-	-	-	-	-	-	-	-	1
C112.4	3	2	1	-	-	-	-	-	-	-	-	-	-	1
C112.5	3	2	1	-	-	-	-	-	-	-	-	-	-	1
C112.6	3	2	1	-	-	-	-	-	-	-	-	-	-	1
C112(Avg)	2.67	1.67	0.67	-	-	-	-	-	-	-	-	-	-	1
C112	3	2	1	-	-	-	-	-	-	-	-	-	-	1
C112.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C112.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C112 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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C113	Course Name :	Electric Circuit Analysis	Course Code :	20EE201

CO	Course Outcomes	Unit	K	POs	PSOs
C113.1	Apply Engineering fundamentals to solve Kirchhoff's laws to simple and complex circuits.	I	K3	1, 2, 3,4	1
C113.2	Apply Engineering fundamentals, Mathematics to Source transformation techniques for analysis of electrical circuit	II	K3	1, 2, 3,4	1
C113.3	Apply Network theorems to linear circuits and to solve simple and complex problems.	III	K3	1, 2, 3,4	1
C113.4	Compute the frequency response of Series and Parallel resonance and analyze tuned circuits.	III	K3	1, 2, 3,4	1
C113.5	Analyze the transient response of RLC Circuits under DC and AC excitation using Laplace transform	IV	K4	1, 2, 3,4	1
C113.6	Analyze three phase balanced and unbalanced star, delta network	V	K4	1, 2, 3,4	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C113.1	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C113.2	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C113.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C113.4	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C113.5	3	3	2	1	-	-	-	2#	2#	2#	-	-	2	-
C113.6	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C113(Avg)	3	2.33	1.33	1	-	-	-	-	-	-	-	-	2	-
C113	3	2	1	1	-	-	-	**1#**	**1#**	**1#**	-	-	2	-
C113.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C113.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C113 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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C115	Course Name:	C Programming Laboratory	Course Code :	20CS2L1

CO	Course Outcomes	K	POs	PSOs
C115.1	Develop simple programs using decision making and looping statements	K3	1, 2, 3,5, 6,7,8,9,10	2
C115.2	Utilize array concepts to perform matrix addition, subtraction and multiplication.	K3	1, 2, 3,5, 6,7,8,9,10	2
C115.3	Utilize string operations and develop programs to show string copy and reverse.	K3	1, 2, 3,5, 6,7,8,9,10	2
C115.4	Develop programs using user defined functions, built-in functions and recursion	K3	1, 2, 3,5, 6,7,8,9,10	2
C115.5	Develop applications using sequential and random access files.	K3	1, 2, 3,5, 6,7,8,9,10	2
C115.6	Develop simple real time projects using the concepts of structures and union	K3	1, 2, 3,5, 6,7,8,9,10	2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C115.1	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115.2	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115.3	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115.4	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115.5	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115.6	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115(Avg)	3	2	1	-	1	1	1	1	2	1	-	-	-	1
C115	3	2	1	-	1	1	1	1	2	1	-	-	-	1

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C116	Course Name:	Electric Circuits Laboratory	Course Code :	20EE2L2

CO	Course Outcomes	K	POs	PSOs
C116.1	Solve simple problems using Kirchhoff's laws and verify the same experimentally	K3	1, 2, 3,5, 6,7,8,9,10	1,2
C116.2	Solve simple problems using network theorems and verify the same experimentally	K3	1, 2, 3,5, 6,7,8,9,10	1,2
C116.3	Determine the Time Constant of RC and RL series circuit and verify the same using hardware.	K3	1, 2, 3,5, 6,7,8,9,10	1,2
C116.4	Measure self, mutual inductance of a coil	K3	1, 2, 3,5, 6,7,8,9,10	1,2
C116.5	Design and simulate series and parallel resonance circuit.	K3	1, 2, 3,5, 6,7,8,9,10	1,2
C116.6	Design and simulate three phase balanced and unbalanced star, delta network	K3	1, 2, 3,5, 6,7,8,9,10	1,2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C116.1	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.2	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.3	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.4	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.5	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.6	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116(Avg)	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116	3	2	1	-	1	1	1	1	2	1	-	-	2	1
C116.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C116.2,3,4	Assignment													

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C202	Course Name :	Digital Logic Circuits	Course Code :	20EE301

CO	Course Outcomes	Unit	K	POs	PSOs
C202.1	Explain the various types of number system and convert different types of codes, simplify theBoolean functions and gate level minimization and implementation.	I	K2	1,2	1
C202.2	Apply the knowledge of Engineering Fundamentals to K –Map for simplification and implementation of combinational logic circuit	II	K3	1,2,3	1
C202.3	Apply the knowledge of Engineering Fundamentals to design the synchronous Sequential logic circuits, draw the block diagram of ShiftRegisters and Counters	III	K3	1,2,3	1
C202.4	Analyze the asynchronous sequential circuits and explain the hazards & errors in digitalcircuits	IV	K3	1,2,3	1
C202.5	Explain the operation of Programmable Logic Devices and digital logic families	V	K2	1,2	1
C202.6	Apply the knowledge of Engineering to write the VHDL coding for combinational logic and Sequential circuits.	V	K3	1,2,3,8,9,10	1

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C202.1	2	1	-	-	-	-	-	-	-	-	-	-	2	-
C202.2	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C202.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C202.4	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C202.5	2	1	-	-	-	-	-	-	-	-	-	-	2	-
C202.6	3	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	2	-
C202(Avg)	2.67	1.67	1	-	-	-	-	-	-	-	-	-	2	-
C202	3	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	2	-
C202.6#	**Assessment for PO8, PO9, PO10:** Video / Seminar Presentation : Ethics (PO8), Individual and team work (PO9), Communication (PO10)													
C202.1,2,3	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality / Personality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C203 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C203	Course Name : Electron Devices and Circuits				Course Code : 20EE302
CO	**Course Outcomes**	**Unit**	**K**	**POs**	**PSOs**
C203.1	Explain the operation and characteristics of PN junction diode, Zener diode, LED and Laser diode.	I	K2	1,2,8,9,10	1,2
C203.2	Apply the knowledge of engineering fundamentals to develop the expression for voltage gain, current gain, input resistance and output resistance of a BJT CE amplifier with voltage divider biasing using h-parameter model.	II	K3	1,2,3	1
C203.3	Apply the knowledge of engineering fundamentals to develop the expression for voltage gain, input resistance and output resistance of FET amplifier under CS and Source follower connection.	III	K3	1,2,3	1
C203.4	Explain the operation of cascade amplifier, differential amplifier, single tuned amplifier and power amplifier.	IV	K2	1,2	1
C203.5	Apply the knowledge of engineering fundamentals to develop the expression for gain with feedback, input resistance and output resistance of different negative feedback connections.	V	K3	1,2,3	1
C203.6	Apply the knowledge of engineering fundamentals to calculate the oscillating frequency of RC and LC tuned Oscillators for a specific application.	V	K3	1,2,3	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C203.1	2	1	-	-	-	-	-	**3#**	**3#**	**3#**	-	-	1	1#
C203.2	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C203.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C203.4	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C203.5	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C203.6	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C203(Avg)	2.67	1.67	0.67	-	-	-	-	0.5	0.5	0.5	-	-	1.25	0.1#
C203	3	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	2	-
C203.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8), Individual and team work (PO9), Communication (PO10)													
C203.2,3,5,6	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	**Roll No**	**Students Name**	**Marks awarded (Max 100 Marks)**	**Attainment Level (Max 3)**
			C203 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C204	Course Name :	ELECTROMAGNETIC THEORY	Course Code :	20EE303

CO	Course Outcomes	Unit	K	POs	PSOs
C204.1	Apply the knowledge of vector calculus to static electromagnetic fields.	I	K3	1,2,3	1
C204.2	Apply the knowledge of engineering fundamentals to the solutions of electrostatics related to electric field.	II	K3	1,2,3	1
C204.3	Apply the principles of electrostatics related to electric potential.	II	K3	1,2,3	1
C204.4	Apply the principles of magneto statics related to magnetic field.	III	K3	1,2,3	1
C204.5	Apply Maxwell's equations in differential and integral forms.	IV	K3	1,2,3	1
C204.6	Apply Maxwell's equations to uniform plane wave propagation in different media.	V	K3	1,2,3	1

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	1	-	-	-	-				-	-	2	-
C204.2	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204.4	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204.5	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204.6	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204(Avg)	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C204	3	2	1	-	-	-	-				-	-	2	-

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C205	Course Name :	Electrical Machines-I	Course Code :	20EE304

CO	Course Outcomes	Unit	K	POs	PSOs
C205.1	Apply the knowledge of engineering fundamentals to calculate the required field turns and brush adjustment to compensate the armature reaction	I	K3	1,2,3,8,9,10	1,2
C205.2	Analyze the characteristics of D.C motor to identify its applications based on requirement	II	K4	1,2,3,4	1
C205.3	Apply the knowledge of engineering fundamentals to calculate the required resistance to minimize the starting current of D.C motor and to predetermine the efficiency of d.c machine in different methods	III	K3	1,2,3	1
C205.4	Explain the construction and working of transformer for different loading condition with required phasor diagram	IV	K2	1,2	1
C205.5	Analyze the conversion of two winding transformer into auto transformer for different connection and to calculate increase in efficiency and cost saving	IV	K4	1,2,3,4	1
C205.6	Apply the knowledge of engineering fundamentals to Calculate the efficiency of distribution transformer by direct loading and indirect loading	V	K3	1,2,3	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C205.1	3	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C205.2	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C205.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C205.4	2	1	-	-	-	-	-	-	-	-	-	-	2	-
C205.5	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C205.6	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C205(Avg)	2.83	2.16	1.4	1	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C205	3	2	1	1	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C205.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8), Individual and team work (PO9), Communication (PO10)													
C205.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C205# - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C206	Course Name :	Universal Human Values	Course Code :	20HS301

CO	Course Outcomes	Unit	POs	PSOs
C206.1	Explain the significance of value inputs in a classroom and start applying them in their life and profession	I	6,7,8,9,12	-
C206.2	Distinguish between Values & Skills to ensure happiness and prosperity.	I	6,7,8,9,12	-
C206.3	Identify the synchronization between Thyself & the Body to ensure competency of an individual	II	6,7,8,9,12	-
C206.4	Generalize the role of a human being in ensuring harmony in society and nature.	III	6,7,8,9,12	-
C206.5	Distinguish between ethical and unethical practices, and Analyze harmonious working environments	IV	6,7,8,9,12	-
C206.6	Assess the importance of value based life and Evaluate the role of professional ethics.	V	6,7,8,9,12	-

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C206.1	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.2	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.3	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.4	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.5	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.6	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206(Avg)	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206	-	-	-	-	-	3	2	1	1	-	-	1	-	-
C206.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													
C206.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C206 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

(As per the Course committee meeting held on 19.08.2021)

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C207	Course Name : ELECTRONICS LABORATORY			Course Code : 20EE3L1	
CO	**Course Outcomes**	**Exp**	**K**	**POs**	**PSOs**
C207.1	Determine the Breakdown voltage, forward and reverse resistance of PN junction diode and Zener diode and calculate the ripple factor of rectifier circuits with filter.	1,2,3,4	K3	1,2,3,9	1
C207.2	Calculate the hybrid parameters of BJT CE and CB configuration from their characteristics.	5	K3	1,2,3,9	1
C207.3	Obtain the frequency response of BJT CE amplifier, feedback amplifier and calculate its bandwidth.	6,11	K3	1,2,3,9	1
C207.4	Obtain the UJT and JFET parameters from the characteristics and also to calculate the gain of differential amplifier using JFET.	7,8,9	K3	1,2,3,9	1
C207.5	Design the RC and LC tuned oscillators for a specific oscillating frequency.	10	K4	1,2,3,4,9	1
C207.6	Analyze the input and output performance of the given diode based circuit using simulation tools.	12	K4	1,2,3,4,5,9	1

CO-PO Mapping

K Level ***Note:***	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), Synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C207.1	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C207.2	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C207.3	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C207.4	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C207.5	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	0.25#
C207.6	3	3	2	1	1	-	-	-	**2#**	-	-	-	2	0.375#
C207(Avg)	3	2.3	1.3	0.3	0.17	-	-	-	**2#**	-	-	-	1.75	0.271#
C207	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**-**
C207.1#	**Assessment for PO9:**													
	Psychomotor (Skill) Domain - Imitation, Manipulation, Precision : Individual and team work (PO9)													

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C208	**Course Name : ELECTRICAL MACHINES LABORATORY-I**	**Course Code : 20EE3L2**			
CO	**Course Outcomes**	**Exp**	**K**	**POs**	**PSOs**
C208.1	Analyze the characteristics of DC shunt, series, compound and BLDC motors by conducting suitable experiment.	1,2,3,12	K4	1,2,3,4,9	1,2
C208.2	Demonstrate armature and field controlled methods for DC shunt motor.	4	K3	1,2,3,9	1,2
C208.3	Predetermine the efficiency of DC shunt machine by conducting suitable experiment	5,8	K3	1,2,3,9	1,2
C208.4	Determine the characteristics of DC generators experimentally	7,9	K3	1,2,3,9	1,2
C208.5	Experimentally, analyze the characteristics of transformer at different loading	10	K4	1,2,3,4,9	1,2
C208.6	Predetermine the performance characteristics of transformer and to find equivalent circuit parameters by conducting suitable experiment	11	K3	1,2,3,9	1,2

CO-PO Mapping

K Level ***Note:***	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C208.1	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.2	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.3	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.4	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.5	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.6	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**2#**
C208(Avg)	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1.17#**
C208	3	2	1	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C208.1#	**Assessment for PO9:**													
	Psychomotor (Skill) Domain - Imitation, Manipulation, Precision : Individual and team work (PO9)													

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C210	Course Name :	Electrical Machines-II	Course Code :	20EE401

CO	Course Outcomes	Unit	K	POs	PSOs
C210.1	Apply the knowledge of engineering fundamentals to Calculate the Voltage regulation of Synchronous generator in different methods	I	K3	1,2,3,8,9,10	1,2
C210.2	Analyze the sharing of Real and Reactive power in Parallel operation of synchronous generator	I	K4	1,2,3,4	1
C210.3	Analyze the variation of armature current and power factor of synchronous motor for corresponding variation of field excitation and load	II	K4	1,2,3,4	1
C210.4	Analyze the change in input power, losses and output power of three phase induction motor corresponding load (slip)	III	K4	1,2,3,4	1
C210.5	Apply the knowledge of engineering fundamentals to calculate the starting torque and current of three phase induction motor for different starters	IV	K3	1,2,3	1
C210.6	Apply the knowledge of engineering fundamentals to Calculate the equivalent circuit parameters and efficiency of single phase induction motor	V	K3	1,2,3	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C210.1	3	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C210.2	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C210.3	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C210.4	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C210.5	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C210.6	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C210(Avg)	3	2.5	1.5	1	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C210	3	3	2	1	-	-	-	**1#**	**1#**	**1#**	-	-	2	**1#**
C210.1#	**Assessment for PO8, PO9, PO10:**													
	Video Presentation : Ethics (PO8), Individual and team work (PO9), Communication (PO10)													
C210.2,3,4	Assignment													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C210# - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C211	**Course Name : Transmission and Distribution**	**Course Code : 20EE402**			
CO	**Course Outcomes**	**Unit**	**K**	**POs**	**PSOs**
C211.1	Apply the knowledge of engineering fundamentals to calculate the transmission network parameters for various configuration.	I	K3	1,2,3	1
C211.2	Apply the knowledge of engineering fundamentals to predict the performance of transmission line.	II	K3	1,2,3	1
C211.3	Apply the knowledge of engineering fundamentals, science, and mathematics to calculate the sag of transmission line.	III	K3	1,2,3	1
C211.4	Apply the knowledge of engineering fundamentals to calculate the voltage distribution in insulator strings and determine the string efficiency of insulator.	III	K3	1,2,3	1
C211.5	Apply the knowledge of engineering fundamentals to compute the electrical parameter of underground cable.	IV	K3	1,2,3	1
C211.6	Explain the types of distribution system.	V	K2	1,2	1

CO-PO MAPPING - R-2020

K Level *Note*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C211.1	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C211.2	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C211.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C211.4	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C211.5	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C211.6	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C211(Avg)	2.67	1.67	0.83	-	-	-	-	-	-	-	-	-	1.83	-
C211	3	2	1	-	-	-	-	-	-	-	-	-	2	-

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C212	Course Name : LINEAR INTEGRATED CIRCUITS AND APPLICATIONS				
				Course Code : 20EE403	
CO	**Course Outcomes**	**Unit**	**K**	**POs**	**PSOs**
C212.1	Explain the IC fabrication process and discuss the fabrication of active and passive components.	I	K2	1,2	1
C212.2	Apply the knowledge of engineering fundamentals to develop the expression for gain and output voltage of the given Op-Amp circuits.	II	K3	1,2,3,5,8,9,10	1,2
C212.3	Apply the knowledge of engineering fundamentals to determine the oscillating/cutoff frequency of waveform generators and filters and also discuss the operation of Op-Amp circuits using diodes.	III	K3	1,2,3,5,8,9,10	1,2
C212.4	Discuss the internal functional blocks and applications of special ICs 555, 566, 565, and AD633 ICs.	IV	K2	1,2,5,8,9,10	1,2
C212.5	Explain the operation of voltage regulator ICs namely LM78XX, LM79XX, LM317 and LM723.	V	K2	1,2	1
C212.6	Discuss the operation of µA78S40 switching regulator, LM 380 power amplifier and ICL 8038 function generator IC.	V	K2	1,2	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C212.1	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C212.2	3	2	1	-	**2#**	-	-	**2#**	**2#**	**2#**	-	-	2	**1#**
C212.3	3	2	1	-	**2#**	-	-	**2#**	**2#**	**2#**	-	-	2	**1#**
C212.4	2	1	-	-	**2#**	-	-	**2#**	**2#**	**2#**	-	-	1	**1#**
C212.5	2	1	-	-	-	-	-	-	**-**	-	-	-	1	-
C212.6	2	1	-	-	-	-	-	-	**-**	-	-	-	1	-
C212(Avg)	2.3	1.3	0.3	-	1	-	-	1	1	1	-	-	1	**0.5#**
C212	2	1	-	-	**1#**	-	-	**1#**	**1#**	**1#**	-	-	1	**1#**
C212.2,3,4,5,6#	**Assessment for PO8, PO9, PO10:**													
	Mini Project : Modern Tool Usage (5), Ethics (PO8), Individual and team work (PO9), Communication (PO10)													
C212.1,5,6	Assignment													

Evaluation Parameters for PO5,PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C212 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C213	Course Name :	Measurements and instrumentation	Course Code :	20EE404

CO	Course Outcomes	Unit	K	POs	PSOs
C213.1	Apply the knowledge of Engineering fundamentals to compute the different statistical parameters.	I	K3	1,2,3	1
C213.2	Explain the concepts of fundamentals of Electrical and Electronic instruments	II	K2	1,2	1
C213.3	Apply the knowledge of Engineering fundamentals to classify AC and DC bridges and formulate balance equation to calculate unknown resistance, inductance and capacitance	III	K3	1,2,3	1
C213.4	Discuss the concepts of transformer ratio bridge and self balancing bridge.	III	K2	1,2	1
C213.5	Explain the various storage and display devices.	IV	K2	1,2	1,2
C213.6	Explain the construction and working of different types of transducer.	V	K2	1,2	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C213.1	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C213.2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C213.3	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C213.4	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C213.5	2	1	-	-	-	-	-	**2#**	**2#**	**2#**	-	-	1	0.75#
C213.6	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C213(Avg)	2.33	1.33	0.33	-	-	-	-	-	-	-	-	-	1.33	0.13#
C213	2	1	-	-	-	-	-	**1#**	**1#**	**1#**	-	-	1	-
C213.1#	**Assessment for PO8, PO9, PO10:** Seminar : Ethics (PO8), Individual and team work (PO9), Communication (PO10)													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation & Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C213 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C214	Course Name :	Environmental Science and Engineering	Course Code :	20HS401

CO	Course Outcomes	Unit	K	POs	PSOs
C214.1	**Describe** the environment ecosystem and their significances .	I	K2	1,2	1
C214.2	Apply the knowledge of science to **identify** the threats to biodiversity and methods to conserve biodiversity	I	K3	1,2,3	1
C214.3	Apply the knowledge of science to **identify** and implement technological and economical solution to environmental pollution	II	K3	1,2,3	1
C214.4	Apply the knowledge of science to **classify** the various natural resources and effect on environment due to over utililization	III	K3	1,2,3	1
C214.5	**Explain** the consequences of natural disasters	IV	K2	1,2,8,9,10	1,2
C214.6	**Outline** the social issues such as welfare, sustainability etc., and to relate with population growth	V	K2	1,2	1

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C214.**1**	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C214.**2**	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C214.**3**	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C214.**4**	3	2	1	-	-	-	-	-	-	-	-	-	2	-
C214.**5**	2	1	-	-	-	-	-	**2#**	**2#**	**2#**	-	-	1	**0.75#**
C214.**6**	2	1	-	-	-	-	-	-	-	-	-	-	1	-
C214**(Avg)**	2.3	1.6	1	-	-	-	-	-	-	-	-	-	1.2	**0.1#**
C214	2	2	1	-	-	-	-	**1#**	**1#**	**1#**	-	-	1	-
C214.**1#**	**AssessmentforPO8, PO9, PO10:** Seminar Presentation/ Video Quality: Ethics (PO8), Individual and team work (PO9), Communication(PO10)													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Seminar Presentation /Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C203 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C215	**Course Name : ELECTRICAL MACHINES LABORATORY-II**	**Course Code : 20EE4L1**			
CO	**Course Outcomes**	**Exp**	**K**	**POs**	**PSOs**
C215.1	Analyze the variation of voltage regulation of synchronous generator experimentally for different power factor and different load in different methods	1,2,3	K4	1,2,3,4,9	1,2
C215.2	Experimentally Analyze the variation of armature current and power factor of synchronous motor for corresponding variation of field excitation and load	4	K4	1,2,3,9	1,2
C215.3	Determine the performance characteristics of single phase , three phase induction motor and Synchronous Reluctance motor experimentally	5,7,12	K3	1,2,3,9	1,2
C215.4	Determine the losses and equivalent circuit parameters of single phase and three phase induction motor experimentally	6,8,10	K3	1,2,3,9	1,2
C215.5	Determine the power sharing while synchronizing synchronous generator with bus bar	9	K3	1,2,3,,9	1,2
C215.6	Measurement of starting current of AC motors with different starter	11	K3	1,2,3,9	1,2

CO-PO Mapping

K Level ***Note:***	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C215.1	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.2	3	3	2	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.3	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.4	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.5	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.6	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**2#**
C215(Avg)	3	2.3	1.3	1	-	-	-	-	**2#**	-	-	-	2	**1.17#**
C215	3	2	1	1	-	-	-	-	**2#**	-	-	-	2	**1#**
C215.1#	**Assessment for PO9:**													
	Psychomotor (Skill) Domain - Imitation, Manipulation, Precision : Individual and team work (PO9)													

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C216	Course Name : Linear And Digital Integrated Circuits Laboratory	Course Code : 20EE4L2			
CO	**Course Outcomes**	**Exp**	**K**	**POs**	**PSOs**
C216.1	Design and implement the combinational logic circuit for the given Boolean function.	1	K3	1,2,3,9	1
C216.2	Design and verify the truth table of sequential logic circuits (code converters, parity generator, parity checker, encoders, decoders, multiplexer and demultiplexer).	2,3,4	K3	1,2,3,9	1
C216.3	Design and implement the Counters and Shift registers.	5,6	K3	1,2,3,9	1
C216.4	Design and testing of Op-Amp circuits (inverting amplifier, non inverting amplifier, adder, comparator, integrator and differentiator). And also analyze the input and output performance of the op-amp based circuit using simulation tools.	7,8,12	K4	1,2,3,4,5,9	1
C216.5	Graph the astable and monostable mode response using Timer IC NE/SE 555.	9	K3	1,2,3,9	1
C216.6	Testing of IC NE/SE 566 to show the voltage to frequency characteristics of VCO and to manipulate the variability voltage regulator using IC LM317.	10,11	K3	1,2,3,9	1

CO-PO Mapping

K Level ***Note:***	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C216.1	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C216.2	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C216.3	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C216.4	3	3	2	1	1	-	-	-	**2#**	-	-	-	2	0.375#
C216.5	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C216.6	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	0.25#
C216(Avg)	3	2.167	1.167	0.17	0.17	-	-	-	**2#**	-	-	-	1.625	0.271#
C216	3	2	1	-	-	-	-	-	**2#**	-	-	-	2	**-**
C216.1,2,3,4,5,6#	**Assessment for PO9:**													
	Psychomotor (Skill) Domain - Imitation, Manipulation, Precision : Individual and team work (PO9)													

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B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

C217	Course Name :	Technical Seminar	Course Code :	20EE4L3

CO	Course Outcomes	K	POs	PSOs
C217.1	**Prepare** and Present the seminar in the field of Electrical and Electronics Engineering subjects studied.	K3	1,2,3,5,6,7,8,9,10,12	1,2
C217.2	**Summarize** and review the research papers to gain understanding of a new field, in the Electrical and Electronics Engineering.	K2	1,2,5,6,7,8,9,10,12	1,2
C217.3	Apply the knowledge of engineering fundamentals to **solve** objective type questions in the field of Electrical and Electronics Engineering.	K3	1,2,3,5,6,7,8,9,10,12	1,2
C217.4	**Interpret** in effective, the subjects learned in the form of seminar Presentation.	K2	1,2,5,6,7,8,9,10,12	1,2
C217.5	**Discuss** effectively, the modern trends in the field of Electrical and Electronics Engineering.	K2	1,2,5,6,7,8,9,10,12	1,2
C217.6	**Explain** efficiently during technical interviews and write reports on seminar topics.	K2	1,2,5,6,7,8,9,10,12	1,2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C217.**1**	3	2	1	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	2	1.3
C217.**2**	2	1	-	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	1	1.3
C217.**3**	3	2	1	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	2	1.3
C217.**4**	2	1	-	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	1	1.3
C217.**5**	2	1	-	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	1	1.3
C217.**6**	2	1	-		**1**	**1**	**1**	**2**	**3**	**3**	-	1	1	1.3
C217 **(Avg)**	1.6	0.6	0.3	-	1	1	1	**2**	**3**	**3**	-	1	1.33	1.3
C217	2	1	-	-	**1**	**1**	**1**	**2**	**3**	**3**	-	1	1	1.3
C217.**1#**	**AssessmentforPO8, PO9, PO10:** Seminar Presentation/ Video Quality : Ethics (PO8),Individual and team work (PO9), Communication(PO10)													

Evaluation Parameters for PO8, PO9, PO10												
Parameters	Timely Submission	Content Quality	Seminar Presentation /Video Quality	Presentation Overview	Presentation	Interaction	Model Used	Doubt Clarification	Societal Impact	Innovation& Scope	Plagiarism	Total
Marks	5	10	5	5	10	10	5	10	15	15	10	100

S,No	Roll No	Students Name	Marks awarded (Max 100 Marks)	Attainment Level (Max 3)
			C203 # - Average value of Attainment Level:	
Note : Attainment level 3 : Marks 80 and above, 2 : Marks 60 - 79, 1 : 50 – 59, 0 : Less than 50				