

**K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM**  
**(An Autonomous Institution, Affiliated to Anna University, Chennai)**  
**B.E. – ELECTRICAL AND ELECTRONICS ENGINEERING**

**REGULATIONS 2020 (students admitted from the academic year 2020-2021 onwards)**

SEMESTER I			SEMESTER II		
1	20HS101	English for Technical Communication	1	20HS201	Advanced Technical Communication
2	20BS101	Fundamentals of Engineering Mathematics	2	20BS201	Laplace Transform and Advanced Calculus
3	20BS102	Engineering Physics	3	20BS203	Physics for Electronics Engineering
4	20BS103	Engineering Chemistry	4	20CS201	Programming in C
5	20GE101	Problem Solving using Python Programming	5	20EE201	Electric Circuit Analysis
6	20BS1L1	Basic Science Laboratory	6	20GE201	Engineering Graphics
7	20GE1L1	Python Programming Laboratory	7	20CS2L1	C Programming Laboratory
8	20GE1L2	Industrial Practices Workshop	8	20EE2L2	Electric Circuits Laboratory
SEMESTER III			SEMESTER IV		
1.	20BS301	Transforms and Partial Differential Equations	1.	20BS402	Numerical Methods
2.	20EE301	Digital Logic Circuits	2.	20EE401	Electrical Machines – II
3.	20EE302	Electron Devices and Circuits	3.	20EE402	Transmission and Distribution
4.	20EE303	Electromagnetic Theory	4.	20EE403	Linear Integrated Circuits and Applications
5.	20EE304	Electrical Machines – I	5.	20EE404	Measurements and Instrumentation
6.	20HS301	Universal Human Values	6.	20HS401	Environmental Science and Engineering
7.	20EE3L1	Electronics Laboratory	7.	20EE4L1	Electrical Machines Laboratory – II
8.	20EE3L2	Electrical Machines Laboratory – I	8.	20EE4L2	Linear and Digital Integrated Circuits Laboratory
			9.	20EE4L3	Technical Seminar
SEMESTER V			SEMESTER VI		
1.	20EE501	Power System Analysis	1.	20EE601	Solid State Drives
2.	20EE502	Power Electronics	2.	20EE602	Power System Operation and Control
3.	20EE503	Digital Signal Processing	3.	20EE603	Embedded Systems
4.	20EE504	Control Systems	4.	20IT301	Object Oriented Programming
5.	20EE505	Microprocessors, Microcontrollers and Applications	5.		Professional Elective I
6.		Open Elective-I	6.		Professional Elective II
7.	20MC501	Constitution of India	7.	20EE6L1	Power Electronics and Drives Laboratory
8.	20EE5L1	Control and Instrumentation Laboratory	8.	20EE6L2	Mini Project
9.	20EE5L2	Microprocessors and Microcontrollers Laboratory	9.	20CS6L3	Object Oriented and JAVA Programming Laboratory
10.	20HS4L2	Professional Communication Laboratory			
SEMESTER VII			SEMESTER VIII		
1.	20EE701	Protection and Switchgear	1.		Professional Elective –V
2.	20EE702	Renewable Energy Systems	2.		Professional Elective VI
3.		Open Elective II	3.	20EE8P1	Project Work
4.		Professional Elective III			
5.		Professional Elective-IV			
6.	20EE7L1	Power System Simulation Laboratory			
7.	20EE7L2	Renewable Energy Systems Laboratory			

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2	20BS101	Fundamentals of Engineering Mathematics	2	20BS201	Laplace Transform and Advanced Calculus
3	20BS102	Engineering Physics	3	20BS203	Physics for Electronics Engineering
4	20BS103	Engineering Chemistry	4	20CS201	Programming in C
5	20GE101	Problem Solving using Python Programming	5	20EE201	Electric Circuit Analysis
6	20BS1L1	Basic Science Laboratory	6	20GE201	Engineering Graphics
7	20GE1L1	Python Programming Laboratory	7	20CS2L1	C Programming Laboratory
8	20GE1L2	Industrial Practices Workshop	8	20EE2L2	Electric Circuits Laboratory
<b>SEMESTER III</b>			<b>SEMESTER IV</b>		
1.	20BS301	Transforms and Partial Differential Equations	1.	20BS402	Numerical Methods
2.	20EE301	Digital Logic Circuits	2.	20EE401	Electrical Machines – II
3.	20EE302	Electron Devices and Circuits	3.	20EE402	Transmission and Distribution
4.	20EE303	Electromagnetic Theory	4.	20EE403	Linear Integrated Circuits and Applications
5.	20EE304	Electrical Machines – I	5.	20EE404	Measurements and Instrumentation
6.	20HS301	Universal Human Values	6.	20HS401	Environmental Science and Engineering
7.	20EE3L1	Electronics Laboratory	7.	20EE4L1	Electrical Machines Laboratory – II
8.	20EE3L2	Electrical Machines Laboratory – I	8.	20EE4L2	Linear and Digital Integrated Circuits Laboratory
			9.	20EE4L3	Technical Seminar
<b>SEMESTER V</b>			<b>SEMESTER VI</b>		
1.	20EE501	Power System Analysis	1.	20EE602	Power System Operation and Control
2.	20EE502	Power Electronics	2.	20IT301	Object Oriented Programming
3.	20EE503	Digital Signal Processing	3.		Open Elective-I
4.	20EE504	Control Systems	4.		Professional Elective-II
5.	20EE505	Microprocessors, Microcontrollers and Applications	5.		Professional Elective-III
6.		Professional Elective-I	6.		Professional Elective –IV
7.	20MC501	Constitution of India	7.	20EE6L1	Power Electronics and Drives Laboratory
8.	20EE5L1	Control and Instrumentation Laboratory	8.	20EE6L2	Mini Project-I
9.	20EE5L2	Microprocessors and Microcontrollers Laboratory	9.	20CS6L3	Object Oriented and JAVA Programming Laboratory
10.	20HS4L2	Professional Communication Laboratory			
<b>SEMESTER VII</b>			<b>SEMESTER VIII</b>		
1.	20EE701	Protection and Switchgear	1.	20EE8L1	Project Work
2.	20EE702	Renewable Energy Systems			
3.		Open Elective –II			
4.		Professional Elective –V			
5.		Professional Elective-VI			
6.		Management Elective			
7.	20EE7L1	Power System SimulationLaboratory			
8.	20EE7L2	Renewable Energy SystemsLaboratory			
9.	20EE7L3	Mini Project-II			

**REGULATIONS 2020 (students admitted from the academic year 2020-2021 onwards)**

Course	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ENG	C101	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
MATHS	C102	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
PHY	C103	2	1	-	-	-	-	-	1	1	1	-	-	1	-	
CHE	C104	2	1	-	-	-	1	1	-	-	-	-	-	1	-	
PSPP	C105	3	2	1	-	-	-	-	-	-	-	-	-	2	1	
BS LAB	C106	3	2	1	-	-	-	-	1	1	1	-	-	1	-	
PP LAB	C107	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
IPW	C108	3	2	1	1	-	-	1	-	1	1	-	-	-	-	
ATC	C109	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
LTAC	C110	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
PHY	C111	2	1	-	-	-	-	-	1	1	1	-	-	-	-	2
PC	C112	3	2	1	-	-	-	-	1	1	-	-	2	3	1	3
ECA	C113	3	3	2	1	-	-	-	2	2	2	-	-	2	2	
EG	C114	3	2	1	-	-	-	-	1	-	-	-	-	-	1	
CP LAB	C115	3	2	1	-	-	-	-	2	2	1	-	2	3	2	
EC LAB	C116	3	2	1	-	1	-	-	1	2	1	-	-	2	1	
TPDE	C201	3	3	1	-	-	-	-	1	1	-	-	-	-	1	
DLC	C202	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
EDC	C203	3	2	1	-	-	-	-	2	2	2	-	-	2	1	
EMT	C204	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
EM-I	C205	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
UHV	C206	-	-	-	-	-	3	2	3	2	2	-	1	-	-	
E LAB	C207	3	2	1	-	-	-	-	2	2	1	-	-	2	2	
EM LAB-I	C208	3	2	1	1	-	-	-	-	2	-	-	-	2	1	
NM	C209	3	2	1	-	-	-	-	1	1	-	-	-	-	-	
EM-II	C210	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
T&D	C211	3	2	1	-	-	-	-	2	2	2	-	-	2	2	
LICA	C212	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
M&I	C213	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
ESE	C214	-	-	-	-	-	2	3	-	-	-	-	-	-	-	
EM LAB-II	C215	3	2	1	-	-	-	-	-	2	-	-	-	2	1	
LDIC LAB	C216	3	3	2	-	-	-	-	2	2	1	-	-	2	1	
TS	C217	-	-	-	-	-	-	-	2	2	2	-	2	-	2	
PSA	C301	3	3	2	1	-	1	1	2	1	-	-	1	2	2	
PE	C302	3	1	1	-	-	-	-	2	2	2	-	-	2	1	
DSP	C303	3	2	1	-	1	-	-	2	2	2	-	-	2	1	
CS	C304	3	3	2	1	-	-	-	-	-	-	-	-	2	-	
MPMCA	C305	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
OE1-CCN	C306	2	1	-	-	-	-	-	1	1	1	-	-	2	1	
CI LAB	C307	3	3	2	1	-	-	-	-	2	-	-	-	2	-	
MPMC LAB	C308	3	2	1	-	1	-	-	-	2	2	-	-	2	1	
PC LAB	C309	-	-	-	-	-	-	-	-	2	3	-	3	-	-	
SSD	C310	2	1	-	-	-	-	-	2	2	2	-	-	1	2	
PSOC	C311	3	2	1	1	-	1	1	2	1	-	-	1	2	2	
ES	C312	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
OOP	C313	3	2	1	-	-	-	-	-	-	-	-	-	3	-	
PE1-DEA	C314A2.6	3	2	1	-	-	-	-	-	-	-	-	-	2	1	
PE2-SEM	C315B2	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
PED LAB	C316	3	2	1	-	-	-	-	-	2	-	-	-	2	2	
Mini Project	C317	3	3	2	1	1	1	1	1	1	1	1	1	2	2	
OOJP LAB	C318	3	3	1	-	3	-	-	1	1	1	-	-	3	3	
COI	C319	-	-	-	-	-	3	-	2	2	2	-	-	2	-	
EITK	C320	-	-	-	-	-	3	-	2	2	2	-	-	2	-	
PSG	C401	2	1	-	-	-	-	-	-	-	-	-	-	2	2	
RES	C402	2	1	-	-	-	-	3	3	-	-	-	-	2	1	
OE2-SPFA	C403	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
PE3-FOLI	C404A5	2	1	-	-	-	-	-	2	2	1	-	-	1	1	
PE4-COA	C405B5	3	1	-	-	-	-	-	1	1	-	-	1	2	1	
PSS LAB	C406	3	2	1	-	2	-	-	1	1	1	-	1	3	3	
RES LAB	C407	3	3	2	1	1	-	-	-	1	-	-	1	3	3	
PE5-EVPM	C408A3	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
PE6-EAM	C409B1	2	1	-	-	-	1	1	2	2	2	-	-	1	1	
Project	C410	3	2	1	-	-	-	-	3	-	-	3	-	3	3	

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Course	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ENG	C101	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
MATHS	C102	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
PHY	C103	2	1	-	-	-	-	-	1	1	1	-	-	1	-	
CHE	C104	2	1	-	-	-	1	1	-	-	-	-	-	1	-	
PSPP	C105	3	2	1	-	-	-	-	-	-	-	-	-	2	1	
BS LAB	C106	3	2	1	-	-	-	-	1	1	1	-	-	1	-	
PP LAB	C107	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
IPW	C108	3	2	1	1	-	-	1	-	1	1	-	-	-	-	
ATC	C109	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
LTAC	C110	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
PHY	C111	2	1	-	-	-	-	-	1	1	1	-	-	-	-	2
PC	C112	3	2	1	-	-	-	-	1	1	-	-	2	3	1	3
ECA	C113	3	3	2	1	-	-	-	2	2	2	-	-	2	2	
EG	C114	3	2	1	-	-	-	-	1	-	-	-	-	-	1	
CPL LAB	C115	3	2	1	-	-	-	-	2	2	1	-	2	3	2	
EC LAB	C116	3	2	1	-	1	-	-	1	2	1	-	-	2	1	
TPDE	C201	3	3	1	-	-	-	-	1	1	-	-	-	-	1	
DLC	C202	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
EDC	C203	3	2	1	-	-	-	-	2	2	2	-	-	2	1	
EMT	C204	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
EM-I	C205	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
UHV	C206	-	-	-	-	-	3	2	3	2	2	-	1	-	-	
E LAB	C207	3	2	1	-	-	-	-	-	2	-	-	-	2	1	
EM LAB-I	C208	3	2	1	1	-	-	-	-	2	-	-	-	2	1	
NM	C209	3	2	1	-	-	-	-	1	1	-	-	-	-	-	
EM-II	C210	3	2	1	-	-	-	-	1	1	1	-	-	2	1	
T&D	C211	3	2	1	-	-	-	-	2	2	2	-	-	2	2	
LICA	C212	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
M&I	C213	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
ESE	C214	-	-	-	-	-	2	3	-	-	-	-	-	-	-	
EM LAB-II	C215	3	2	1	-	-	-	-	-	2	-	-	-	2	1	
LDIC LAB	C216	3	3	2	-	-	-	-	-	2	-	-	-	2	1	
TS	C217	-	-	-	-	-	-	-	2	2	2	-	2	-	2	
PSA	C301	3	3	2	1	-	1	1	2	1	-	-	1	2	2	
PE	C302	3	1	1	-	-	-	-	2	2	2	-	-	2	1	
DSP	C303	3	2	1	-	1	-	-	2	2	2	-	-	2	1	
CS	C304	3	3	2	1	-	-	-	-	-	-	-	-	2	-	
MPMCA	C305	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
PE1-PQ	C306V1	3	2	1	-	-	-	-	2	2	2	-	-	2	2	
CI LAB	C307	3	3	2	1	-	-	-	-	2	-	-	-	2	-	
MPMC LAB	C308	3	2	1	-	1	-	-	-	2	2	-	-	2	1	
PC LAB	C309	-	-	-	-	-	-	-	-	2	3	-	3	-	-	
PSOC	C310	3	2	1	1	-	1	1	2	1	-	-	1	2	2	
OOP	C311	3	2	1	-	3	-	-	-	2	2	-	-	3	1	
OE1-IoTA	C312	3	2	1	-	-	-	-	-	-	-	-	1	1	1	
PE2-DEA	C4V83	3	2	1	-	-	-	-	-	-	-	-	-	2	1	
PE3-SEM	C313V2	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
PE4-ESD	C314V4	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
PED LAB	C316	3	2	1	-	-	-	-	-	2	-	-	-	2	2	
Mini Project-I	C317	3	3	2	1	1	1	1	1	1	1	1	1	2	2	
OOJP LAB	C318	3	3	1	-	3	-	-	1	1	1	-	-	3	3	
COI	C319	-	-	-	-	-	3	-	2	2	2	-	-	2	-	
PECEV	C306V3	2	1	-	-	-	-	-	2	2	2	-	-	2	1	
PSG	C401	2	1	-	-	-	-	-	-	-	-	-	-	2	2	
RES	C402	2	1	-	-	-	-	3	3	-	-	-	-	2	1	
OE2-ISP	C403	3	3	1	1	-	2	-	-	-	1	-	1	2	1	-
PE5-EAM	C315V1	2	1	-	-	-	1	1	2	2	2	-	-	1	1	
PE6- EEGUC	C4V61	2	1	-	-	-	-	-	2	2	2	-	-	1	1	
ME-TQM	C405	3	2	1	-	1	-	-	-	-	-	2	1	2	2	1
PSS LAB	C407	3	3	2	1	2	-	-	1	1	1	-	1	3	3	
RES LAB	C408	3	3	2	1	1	-	-	-	1	-	-	1	3	3	
Mini Project-II	C409	3	3	2	1	1	1	1	1	1	1	1	1	2	2	
Project	C410	3	2	1	-	-	-	-	3	-	-	3	-	3	3	

**COURSE OUTCOME, CO-PO MAPPING**

Course Name : English for Technical Communication										Course Code : 20HS101					
CO	Course Outcomes									Unit	K-CO	POs	PSOs		
C101.1	Listen, Comprehend and Correspond with others at various contexts									I-V	AD	9,10,12	3		
C101.2	Speak legibly and fluently under various life-time situations by applying proper communication modules									I-V	AD	9,10,12	3		
C101.3	Read and understand a variety of writings and technical text by analyzing the meaning and language									I-V	AD	9,10,12	3		
C101.4	Apply clear and legible writing skills in error free style in coherent manner									I-V	AD	9,10,12	3		
C101.5	Remember and use various communicative skills in precise and efficient way on technological contexts									I-V	AD	9,10,12	3		
C101.6	Form situational conversations and technical writing styles for interpersonal and effective communication									I-V	AD	9,10,12	3		
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C101.1	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C101.2	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C101.3	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1
C101.4	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1
C101.5	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C101.6	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1

Course Name : FUNDAMENTALS OF ENGINEERING MATHEMATICS										Course Code : 20BS101					
CO	Course Outcomes									Unit	K-CO	POs	PSOs		
C102.1	Determine the Eigen values, Eigen vectors to diagonalize a matrix and reduce quadratic form to canonical form.									I	K3	1,2,3,8,9	1		
C102.2	Apply the concept of limits, continuity, rules of differentiation techniques of differentiation to differentiate standard functions.									II	K3	1,2,3,8,9	1		
C102.3	Apply the concepts of Concavity, Convexity to determine the critical points, point of Inflection, Maxima and Minima of Single variable functions.									II	K3	1,2,3,8,9	1		
C102.4	Compute the derivatives of functions of two variables and apply them to calculate the maxima and minima.									III	K3	1,2,3,8,9	1		
C102.5	Determine integrals using techniques of integration, such as substitution, partial fractions and integration by parts.									IV	K3	1,2,3,8,9	1		
C102.6	Apply various techniques to solve higher order differential equations with constant and variable Coefficients.									V	K3	1,2,3,8,9	1		
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C102.1	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C102.2	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C102.3	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C102.4	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C102.5	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C102.6	3	2	1	-	-	-	-	1	1	-	-	-	2	-	



Course Name: PROBLEM SOLVING USING PYTHON PROGRAMMING											Course Code: 20GE101			
CO	Course Outcomes										Unit	K –CO	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	1,2
C105.2	Perform problem analysis, use algorithms and prepare flow charts, pseudo code for solving simple problems.										I	K3	1,2	1,2
C105.3	Use Conditional, iteration constructs of python programming and apply to solve simple problems										II	K3	1,2,3	1,2
C105.4	Use Functions, recursive function, String functions in python programming and apply to perform linear and binary search										III	K3	1,2,3	1,2
C105.5	Explain the various operations for manipulating Tuples, Dictionaries and Use List toper form simple and sorting operations										IV	K3	1,2,3	1,2
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	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C105.1	2	1	-	-	-	-	-	-	-	-	-	-	2	1
C105.2	2	1	-	-	-	-	-	-	-	-	-	-	2	1
C105.3	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.4	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.5	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.6	3	2	1	-	-	-	-	-	-	-	-	-	2	1

Course Name: BASIC SCIENCE LABORATORY											Course Code:20BS1L1			
CO	Course Outcomes										Exp	K	POs	PSOs
PHYSICS														
C106.1	Calculate rigidity modulus and Young's modulus of a given material.										1,2	K3	1,2,3,8,9,10	1
C106.2	Examine the size of a given particle, parameters of optical fiber and compute the thickness of a given thin wire.										3,6	K3	1,2,3,8,9,10	1
C106.3	Discover the velocity of ultrasound, compressibility of a given liquid and band gap of a given semiconductor diode.										4,5	K3	1,2,3,8,9,10	1
C106.4	Predict dispersive power of prism and wavelength of mercury spectrum.										7,8	K2	1,2,8,9,10	1
CHEMISTRY														
C106.5	Estimate the Chemical quality parameter of a water sample.										1,2,3	K3	1,2,3,8,9,10	1
C106.6	Estimate the strength of acid by conductometric and pH metric titration.										4,6,7	K3	1,2,3,8,9,10	1
C106.7	Estimate the amount of iron content in a given solution using potentiometer and the amount of sodium in water using flame photometer.										5,10	K3	1,2,3,8,9,10	1
C106.8	Determine the molecular weight of polyvinyl alcohol using Ostwald viscometer and rate of corrosion by weight loss method. (Demo)										8,9	K2	1,2	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PHYSICS														
C106.1	3	2	1	-	-	-	-	1	1	1	-	-	1	-
C106.2	3	2	1	-	-	-	-	1	1	1	-	-	1	-
C106.3	3	2	1	-	-	-	-	1	1	1	-	-	1	-
C106.4	2	1	-	-	-	-	-	1	1	1	-	-	1	-
CHEMISTRY														
C106.5	3	2	1	-	-	-	-	1	1	1	-	-	1	-
C106.6	3	2	1	-	-	-	-	1	1	1	-	-	1	-

C106.7	3	2	1	-	-	-	-	1	1	1	-	-	1	-
C106.8	2	1	-	-	-	-	-	-	-	-	-	-	1	-

Course Name : PYTHON PROGRAMMING LABORATORY											Course Code : 20GE1L1			
CO	Course Outcomes										EXP	K-CO	POs	PSO
C107.1	Develop simple Python programs using conditional and iterative constructs										1,2,7	K3	1,2,3,5	1,2
C107.2	Develop simple Python programs using built-in functions and user-defined functions										3	K3	1,2,3,5	1,2
C107.3	Develop a Python program using recursion to implement linear and binary search										4	K3	1,2,3,5	1,2
C107.4	Develop a Python program using list to implement selection and insertion sort										5,6	K3	1,2,3,5	1,2
C107.5	Develop Python programs to implement matrix operations										8,9	K3	1,2,3,5	1,2
C107.6	Develop a Python program to implement file handling										10,11,12	K3	1,2,3,5	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C107.1	3	2	1	-	1	-	-	-	-	-	-	-	2	1
C107.2	3	2	1	-	1	-	-	-	-	-	-	-	2	1
C107.3	3	2	1	-	1	-	-	-	-	-	-	-	2	1
C107.4	3	2	1	-	1	-	-	-	-	-	-	-	2	1
C107.5	3	2	1	-	1	-	-	-	-	-	-	-	2	1
C107.6	3	2	1	-	1	-	-	-	-	-	-	-	2	1

Course Name : INDUSTRIAL PRACTICES WORKSHOP											Course Code : 20GE1L2			
CO	Course Outcomes										EXP	K-CO	POs	PSO
<b>GROUP A (CIVIL &amp; MECHANICAL)</b>														
C108.1	Prepare different carpentry joints and pipe connections with different joints.											K3	1,2,3,4	-
C108.2	Make the models using sheet metal.											K3	1,2,3,4	-
C108.3	Carry out the basic machining operations.											K3	1,2,3,4	-
C108.4	Prepare arc welded joints using welding equipment											K3	1,2,3,4	-
<b>GROUP B (ELECTRICAL &amp; ELECTRONICS)</b>														
C108.5	Demonstrate wiring for a simple residential house; identify the ratings of tube lamp, and calculate the different Electrical quantities											K3	1,2,3,4,7,9,10	-
C108.6	Measure the electronics equipment using LCR meter, Transistor & Diode – Terminal identification using Multimeter.											K3	1,2,3,4,7,9,10	-
C108.7	Experimentally to analyze AC signal parameters using CRO and AFO and to verify the Truth tables of Logic gates.											K3	1,2,3,4,7,9,10	-
C108.8	Experimentally to design a Simple circuit using soldering in a PCB, measure ripple factor of Half Wave Rectifier and Full Wave Rectifier.											K3	1,2,3,4,7,9,10	-
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>GROUP A (CIVIL &amp; MECHANICAL)</b>														
C108.1	3	1	1	1	-	-	-	-	-	-	-	-	-	-
C108.2	3	1	1	1	-	-	-	-	-	-	-	-	-	-
C108.3	3	1	1	1	-	-	-	-	-	-	-	-	-	-
C108.4	3	2	1	1	-	-	-	-	-	-	-	-	-	-
<b>GROUP B (ELECTRICAL &amp; ELECTRONICS)</b>														
C108.5	3	2	1	1	-	-	2	-	2	2	-	-	-	-
C108.6	3	2	1	1	-	-	2	-	2	2	-	-	-	-
C108.7	3	2	1	1	-	-	2	-	2	2	-	-	-	-
C108.8	3	2	1	1	-	-	2	-	2	2	-	-	-	-



Course Name : ADVANCED TECHNICAL COMMUNICATION											Course Code : 20HS201				
CO	Course Outcomes										Unit	K-CO	POs	PSOs	
C109.1	Listen, Understand and create technical correspondence at advanced level.										I-V	AD	9,10,12	3	
C109.2	Respond or answer to the contextual questions, interview questions, form instructions, draft reports										I-V	AD	9,10,12	3	
C109.3	Speak and analyze social issues, come out with effective ideas for discussion, understand the passages for meaning and vocabulary										I-V	AD	9,10,12	3	
C109.4	Assess error free technical writings, create legible and coherent technical papers, derive ideas of the given texts in a precise form										I-V	AD	9,10,12	3	
C109.5	Remember the updated elements of communication skills, nuances of non-verbal communication, business communication										I-V	AD	9,10,12	3	
C109.6	Create technical instructions, process instructions, self-appraisals, Resumes, reports on various situations										I-V	AD	9,10,12	3	
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C109.1	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C109.2	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C109.3	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1
C109.4	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1
C109.5	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1
C109.6	-	-	-	-	-	-	-	-	3	3	-	2	-	-	1

Course Name : LAPLACE TRANSFORM AND ADVANCED CALCULUS											Course Code : 20BS201				
CO	Course Outcomes										Unit	K	POs	PSOs	
C110.1	Determine the Laplace transform of standard functions using properties										I	K3	1,2,3,8,9	1	
C110.2	Apply Laplace transform and inverse transform to solve the initial value problems										I	K3	1,2,3,8,9	1	
C110.3	Solve the multiple integrals and apply the concept to find areas, volumes										II	K3	1,2,3,8,9	1	
C110.4	Determine the line, surface and volume integrals using Green's, Gauss and Stokes theorems										III	K3	1,2,3,8,9	1	
C110.5	Determine Analytic functions, Bilinear Transformations and apply the concept of conformal mapping to find the images of given curves.										IV	K3	1,2,3,8,9	1	
C110.6	Determine the Contour Integrals using Cauchy's Integral and Residue theorems.										V	K3	1,2,3,8,9	1	
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C110.1	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C110.2	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C110.3	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C110.4	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C110.5	3	2	1	-	-	-	-	1	1	-	-	-	2	-	
C110.6	3	2	1	-	-	-	-	1	1	-	-	-	2	-	

Course Name : PHYSICS FOR ELECTRONICS ENGINEERING											Course Code : 20BS203				
CO	Course Outcomes										Unit	K-CO	POs	PSOs	
C111.1	Distinguish classical, quantum electron theories and energy band theory										I	K2	1,2	3	
C111.2	Discuss the properties of semiconductors with applications of the p-n Junction and diodes										II	K2	1,2,8,9,10	3	
C111.3	Explain dielectric properties of materials										III	K2	1,2,8,9,10	3	
C111.4	Apply the concept of optical materials for Opto – electronic applications										IV	K3	1,2,3,8,9,10	3	
C111.5	Summarize the basic operations of p-n junction devices like solar cells, LED, LCD etc										IV	K2	1,2	3	
C111.6	Explain different quantum structures, size effect and carbon nanotubes										V	K2	1,2,8,9,10	3	
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C111.1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2
C111.2	2	1	-	-	-	-	-	1	1	1	-	-	-	-	2
C111.3	2	1	-	-	-	-	-	1	1	1	-	-	-	-	2
C111.4	3	2	1	-	-	-	-	1	1	1	-	-	-	-	3
C111.5	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2
C111.6	2	1	-	-	-	-	-	1	1	1	-	-	-	-	2

Course Name : PROGRAMMING IN C											Course Code : 20CS201				
CO	Course Outcomes										Unit	K-CO	POs	PSOs	
C112.1	Use basic constructs of C programming to develop simple programs.										I	K3	1,2,3,8,9,12	1,3	
C112.2	Apply one dimensional and two dimensional arrays for implementing matrix operations and string operations.										II	K3	1,2,3,8,9,12	1,3	
C112.3	Make use of function concept for solving simple mathematical										III	K3	1,2,3,8,9,12	1,3	
C112.4	Develop programs to implement pointer arithmetic and arrays with										III	K3	1,2,3,8,9,12	1,3	
C112.5	Illustrate simple programs for structures and unions and develop real time application programs										IV	K4	1,2,3,4,8,9,12	1,2,3	
C112.6	Apply various file operations and develop programs to implement file										V	K3	1,2,3,8,9,12	1,2,3	
CO-PO mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C112.1	3	2	1	-	-	-	-	1	1	-	-	2	3	-	3
C112.2	3	2	1	-	-	-	-	1	1	-	-	2	3	-	3
C112.3	3	2	1	-	-	-	-	1	1	-	-	2	3	-	3
C112.4	3	2	1	-	-	-	-	1	1	-	-	2	3	-	3
C112.5	3	3	2	1	-	-	-	2	2	-	-	2	3	1	3
C112.6	3	2	1	-	-	-	-	1	1	-	-	2	3	1	3
C112	3	2	1	-	-	-	-	1	1	-	-	2	3	1	3

Course Name : ELECTRIC CIRCUIT ANALYSIS		Course Code : 20EE201			
CO	Course Outcomes	Unit	K –CO	POs	PSOs
C113.1	Apply Engineering fundamentals to solve Kirchhoff's laws to simple and complex circuits.	I	K3	1,2,3,8,9,10	1,2
C113.2	Apply Engineering fundamentals, Mathematics to Source transformation techniques for analysis of electrical circuit	II	K3	1,2,3,8,9,10	1,2
C113.3	Apply Network theorems to linear circuits and to solve simple and complex problems.	III	K3	1,2,3,8,9,10	1,2
C113.4	Compute the frequency response of Series and Parallel resonance and analyze tuned circuits.	III	K3	1,2,3,8,9,10	1,2
C113.5	Analyze the transient response of RLC Circuits under DC and AC excitation using Laplace transform	IV	K4	1,2,3,4,8,9,10	1,2
C113.6	Analyze three phase balanced and unbalanced star, delta network	V	K4	1,2,3,4,8,9,10	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C113.1	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C113.2	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C113.3	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C113.4	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C113.5	3	3	2	1	-	-	-	2	2	2	-	-	2	2
C113.6	3	3	2	1	-	-	-	2	2	2	-	-	2	2
C113	3	3	2	1	-	-	-	2	2	2	-	-	2	2

Course Name : ENGINEERING GRAPHICS		Course Code : 20GE201			
CO	Course Outcomes	Unit	K –CO	POs	PSOs
C114.1	Familiarize with the fundamentals and standards of engineering graphics.	-	K2	1,2,8	2
C114.2	Draw the orthographic projections of points and lines.	I	K3	1,2,3,8	2
C114.3	Draw the orthographic projections of plane surfaces.	II	K3	1,2,3,8	2
C114.4	Draw the projections of simple solids like prisms, pyramids, cylinder and cone.	III	K3	1,2,3,8	2
C114.5	Draw the projections of sectional views of solids and develop its lateral surfaces.	IV	K3	1,2,3,8	2
C114.6	Draw the isometric projection and free hand sketching of simple objects.	V	K3	1,2,3,8	2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C114.1	2	1	-	-	-	-	-	1	-	-	-	-	-	1
C114.2	3	2	1	-	-	-	-	1	-	-	-	-	-	1
C114.3	3	2	1	-	-	-	-	1	-	-	-	-	-	1
C114.4	3	2	1	-	-	-	-	1	-	-	-	-	-	1
C114.5	3	2	1	-	-	-	-	1	-	-	-	-	-	1
C114.6	3	2	1	-	-	-	-	1	-	-	-	-	-	1

Course Name : C PROGRAMMING LABORATORY		Course Code : 20CS2L1			
CO	Course Outcomes	EXP	K –CO	POs	PSO
C115.1	Develop simple programs using decision making and looping statements.	1-5	K3	1,2,3,8,9,10,12	1,2
C115.2	Utilize array concepts to perform matrix addition, subtraction and multiplication.	6,7	K3	1,2,3,8,9,10,12	1,2
C115.3	Utilize string operations and develop programs to show string copy and reverse.	8	K3	1,2,3,8,9,10,12	1,2
C115.4	Develop programs using user defined functions, built-in functions and recursion.	9-12	K3	1,2,3,8,9,10,12	1,2
C115.5	Develop applications using sequential and random access files.	14,15	K3	1,2,3,8,9,10,12	1,2
C115.6	Develop simple real time projects using the concepts of structures and union.	13,16	K3	1,2,3,8,9,10,12	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C115.1	3	2	1	-	-	-	-	2	2	1	-	2	3	1
C115.2	3	2	1	-	-	-	-	2	2	1	-	2	3	1
C115.3	3	2	1	-	-	-	-	2	2	1	-	2	3	1
C115.4	3	2	1	-	-	-	-	2	2	1	-	2	3	1
C115.5	3	2	1	-	-	-	-	2	2	1	-	2	3	2
C115.6	3	2	1	-	-	-	-	2	2	1	-	2	3	2

Course Name : ELECTRIC CIRCUITS LABORATORY		Course Code : 20EE2L2			
CO	Course Outcomes	EXP	K –CO	POs	PSO
C116.1	Solve simple problems using Kirchoff's laws and verify the same experimentally	1	K3	1,2,3,5,8,9,10	1,2
C116.2	Solve simple problems using network theorems and verify the same experimentally	2,3,4,5,6	K3	1,2,3,5,8,9,10	1,2
C116.3	Determine the Time Constant of RC and RL series circuit and verify the same using hardware.	7	K3	1,2,3,5,8,9,10	1,2
C116.4	Measure self, mutual inductance of a coil	8	K3	1,2,3,5,8,9,10	1,2
C116.5	Design and simulate series and parallel resonance circuit.	9	K3	1,2,3,5,8,9,10	1,2
C116.6	Design and simulate three phase balanced and unbalanced star, delta network	10	K3	1,2,3,5,8,9,10	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C116.1	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116.2	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116.3	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116.4	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116.5	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116.6	3	2	1	-	1	-	-	1	2	1	-	-	2	1
C116	3	2	1	-	1	-	-	1	2	1	-	-	2	1

Course Name : TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS											Course Code : 20BS301			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C201.1	Solve the given first order partial differential equations.										1	K3	1,2,3,8,9	-
C201.2	Solve linear partial differential equation of second and higher order with constant coefficients.										1	K3	1,2,3,8,9	-
C201.3	Solve differential equations using Fourier series analysis.										2	K3	1,2,3,8,9	-
C201.4	Solve one, two dimensional heat flow problems and one dimensional wave equation problems.										3	K3	1,2,3,8,9	-
C201.5	Compute the Fourier transforms of various functions.										4	K3	1,2,3,8,9	-
C201.6	Apply Z-transforms techniques to solve difference equation.										5	K3	1,2,3,8,9	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201.1	3	2	1	-	-	-	-	1	1	-	-	-	-	1
C201.2	3	2	1	-	-	-	-	1	1	-	-	-	-	1
C201.3	3	2	1	-	-	-	-	1	1	-	-	-	-	1
C201.4	3	2	1	-	-	-	-	1	1	-	-	-	-	1
C201.5	3	2	1	-	-	-	-	1	1	-	-	-	-	1
C201.6	3	3	2	1	-	-	-	-	-	-	-	-	2	-
C201	3	3	1	-	-	-	-	1	1	-	-	-	-	1

Course Name : DIGITAL LOGIC CIRCUITS											Course Code : 20EE301			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C202.1	Explain the various types of number system and to convert the different types of codes, simplify the Boolean functions and gate level minimization and implementation.										I	K2	1,2,8,9,10	1
C202.2	Apply the knowledge of Engineering Fundamentals to K –Map for simplification and implementation of combinational logic circuits										II	K3	1,2,3,8,9,10	1
C202.3	Apply the knowledge of Engineering Fundamentals to design the synchronous Sequential logic circuits, Shift Registers and Counters										III	K3	1,2,3,8,9,10	1
C202.4	Explain the operation of Programmable Logic Devices and digital logic families and to analyze the asynchronous sequential circuits and explain the hazards & errors in digital circuits										IV	K3	1,2,3,8,9,10	1
C202.5	Explain the operation of Programmable Logic Devices and digital logic families										V	K2	1,2,8,9,10	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
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	2	1	-	-	-	-	-	1	1	1	-	-	2	1
C202.2	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C202.3	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C202.4	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C202.5	2	1	-	-	-	-	-	1	1	1	-	-	2	1
C202.6	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C202	3	2	1	-	-	-	-	1	1	1	-	-	2	1

Course Name : ELECTRON DEVICES AND CIRCUITS											Course Code : 20EE302			
CO	Course Outcomes										Unit	K –CO	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	1,2,3,8,9,10	1,2
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	1,2,3,8,9,10	1,2
C203.4	Explain the operation of cascade amplifier, differential amplifier, single tuned amplifier and power amplifier.										IV	K2	1,2,8,9,10	1,2
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	1,2,3,8,9,10	1,2
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	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C203.2	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C203.3	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C203.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C203.5	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C203.6	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C203	3	2	1	-	-	-	-	2	2	2	-	-	2	1

Course Name : ELECTROMAGNETIC THEORY											Course Code : 20EE303			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C204.1	Apply the knowledge of mathematics, engineering fundamentals to static electromagnetic fields.										I	K3	1,2,3,8,9,10	1,2
C204.2	Apply the knowledge of mathematics, science, engineering fundamentals to electrostatics related to electric field.										II	K3	1,2,3,8,9,10	1,2
C204.3	Apply the principles of electrostatics related to electric potential.										II	K3	1,2,3,8,9,10	1,2
C204.4	Apply the knowledge of mathematics, science, and engineering fundamentals to magneto statics related to magnetic field.										III	K3	1,2,3,8,9,10	1,2
C204.5	Apply the knowledge of mathematics, science, engineering fundamentals to Maxwell's equations in differential and integral forms.										IV	K3	1,2,3,8,9,10	1,2
C204.6	Apply Maxwell's equations to uniform plane wave propagation in different media.										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204.2	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204.3	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204.4	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204.5	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204.6	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C204	3	2	1	-	-	-	-	1	1	1	-	-	2	1

Course Name : ELECTRICAL MACHINES – I											Course Code : 20EE304			
CO	Course Outcomes										Unit	K –CO	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	Apply the knowledge of engineering fundamentals to calculate the efficiency of D.C motor to identify its applications based on requirement.										II	K3	1,2,3,8,9,10	1,2
C205.3	Apply the knowledge of engineering fundamentals to control the speed of DC motors and to calculate the efficiency of DC machine in different methods.										III	K3	1,2,3,8,9,10	1,2
C205.4	Apply the knowledge of engineering fundamentals to calculate the efficiency and voltage regulation of single phase transformer										IV	K3	1,2,3,8,9,10	1,2
C205.5	Apply the knowledge of engineering fundamentals to determine the power conversion efficiency of auto transformer and copper saving										IV	K3	1,2,3,8,9,10	1,2
C205.6	Apply the knowledge of engineering fundamentals to Calculate the efficiency of single and three phase distribution transformer by direct loading and indirect loading										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	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	2	1	-	-	-	-	1	1	1	-	-	2	1
C205.3	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C205.4	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C205.5	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C205.6	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C205	3	2	1	-	-	-	-	1	1	1	-	-	2	1

Course Name : UNIVERSAL HUMAN VALUES											Course Code : 20HS301			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C206.1	Explain the significance of value inputs in a classroom and summarize human aspirations.										1	AD	6,7,8,9,10,12	-
C206.2	Distinguish between Values & Skills to ensure happiness and prosperity.										1	AD	6,7,8,9,10,12	-
C206.3	Identify the synchronization between Thyself & the Body to ensure competency of an individual										2	AD	6,7,8,9,10,12	-
C206.4	Generalize the role of a human being in ensuring harmony in society and nature.										3	AD	6,7,8,9,10,12	-
C206.5	Distinguish between ethical and unethical practices and analyze harmonious social environment.										4	AD	6,7,8,9,10,12	-
C206.6	Assess the importance of value based life and evaluate the role of professional ethics.										5	AD	6,7,8,9,10,12	-
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206.2	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206.3	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206.4	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206.5	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206.6	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C206	-	-	-	-	-	3	2	3	2	2	-	1	-	-

Course Name : ELECTRONICS LABORATORY		Course Code : 20EE3L1			
CO	Course Outcomes	EXP	K –CO	POs	PSO
C207.1	Conduct an experiment to 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	1,2
C207.2	Conduct an experiment to calculate the hybrid parameters of BJT CE and CB configuration from their characteristics.	5	K3	1,2,3,9	1,2
C207.3	Conduct an experiment to show the frequency response of BJT CE amplifier, feedback amplifier and calculate its bandwidth.	6,11	K3	1,2,3,9	1,2
C207.4	Conduct an experiment to 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	1,2
C207.5	Conduct an experiment to design a RC and LC tuned oscillators and verify the practical oscillation frequency with theoretical value.	10	K3	1,2,3,9	1,2
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	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C207.2	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C207.3	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C207.4	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C207.5	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C207.6	3	3	2	1	1	-	-	-	2	-	-	-	2	1
C207	3	2	1	-	-	-	-	-	2	-	-	-	2	1

Course Name : ELECTRICAL MACHINES LABORATORY – I		Course Code : 20EE3L2			
CO	Course Outcomes	EXP	K –CO	POs	PSO
C208.1	Conduct an experiment to examine the characteristics of DC shunt, series, and compound motors by conducting suitable experiment.	1,2,3	K3	1,2,3,9	1,2
C208.2	Conduct an experiment to control the speed of DC motor in armature and field controlled methods.	4	K3	1,2,3,9	1,2
C208.3	Conduct an experiment to predetermine the efficiency of DC shunt machines	5,8	K3	1,2,3,9	1,2
C208.4	Conduct an experiment to determine the characteristics of DC generators	6,7	K3	1,2,3,9	1,2
C208.5	Conduct an experiment to calculate the efficiency and voltage regulation of single phase transformer at different loading condition and to obtain its equivalent circuit parameters.	9,10,11	K3	1,2,3,9	1,2
C208.6	Conduct an experiment to analyze the characteristics of BLDC motor using MATLAB/ Suitable software tools.	12	K4	1,2,3,4,9	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	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	2	1	-	-	-	-	-	2	-	-	-	2	1
C208.6	3	3	2	1	-	-	-	-	2	-	-	-	2	1
C208	3	2	1	1	-	-	-	-	2	-	-	-	2	1



Course Name : NUMERICAL METHODS											Course Code : 20BS402			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C209.1	Solve Algebraic and transcendental equations.										1	K3	1,2,3,8,9	-
C209.2	Apply Newton's forward, backward and Lagrange's formula for interpolation with equal and unequal intervals.										2	K3	1,2,3,8,9	-
C209.3	Compute finite differences using Newton's forward and backward interpolation formula.										2	K3	1,2,3,8,9	-
C209.4	Apply numerical differentiation and integration for single and two variable functions.										3	K3	1,2,3,8,9	-
C209.5	Solve initial value problem using single step and multi step method.										4	K3	1,2,3,8,9	-
C209.6	Solve the boundary value problem using finite difference method.										5	K3	1,2,3,8,9	-
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209.2	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209.3	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209.4	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209.5	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209.6	3	2	1	-	-	-	-	1	1	-	-	-	-	-
C209	3	2	1	-	-	-	-	1	1	-	-	-	-	-

Course Name : ELECTRICAL MACHINES - II											Course Code : 20EE401			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C210.1	Apply the knowledge of engineering fundamentals to calculate the various methods of voltage regulation of Synchronous generator.										I	K3	1,2,3,8,9,10	1,2
C210.2	Apply the knowledge of engineering fundamentals to calculate the sharing of Real and Reactive power in Parallel operation of synchronous generator.										I	K3	1,2,3,8,9,10	1,2
C210.3	Analyze the variation of armature current and power factor of synchronous motor for various field excitations at no load and full load.										II	K4	1,2,3,8,9,10	1,2
C210.4	Apply the knowledge of engineering fundamentals to calculate the change in input power, losses and output power of three phase induction motor for various load conditions.										III	K3	1,2,3,8,9,10	1,2
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	1,2,3,8,9,10	1,2
C210.6	Apply the knowledge of engineering fundamentals to Calculate the equivalent circuit parameters and efficiency of single phase induction motor										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	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	2	1	-	-	-	-	1	1	1	-	-	2	1
C210.3	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C210.4	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C210.5	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C210.6	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C210	3	2	1	-	-	-	-	1	1	1	-	-	2	1

Course Name : TRANSMISSION AND DISTRIBUTION											Course Code : 20EE402			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C211.1	Apply the knowledge of engineering fundamentals to calculate the transmission network parameters for various configuration.										I	K3	1,2,3,8,9,10	1,2
C211.2	Apply the knowledge of engineering fundamentals to predict the performance of transmission line.										II	K3	1,2,3,8,9,10	1,2
C211.3	Apply the knowledge of engineering fundamentals, science, and mathematics to calculate the sag of transmission line.										III	K3	1,2,3,8,9,10	1,2
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	1,2,3,8,9,10	1,2
C211.5	Apply the knowledge of engineering fundamentals to compute the electrical parameter of underground cable.										IV	K3	1,2,3,8,9,10	1,2
C211.6	Explain the types of distribution system.										V	K2	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C211.2	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C211.3	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C211.4	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C211.5	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C211.6	2	1	-	-	-	-	-	2	2	2	-	-	2	2
C211	3	2	1	-	-	-	-	2	2	2	-	-	2	2

Course Name : LINEAR INTEGRATED CIRCUITS AND APPLICATIONS											Course Code : 20EE403			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C212.1	Explain the IC fabrication process and discuss the fabrication of active and passive components.										I	K2	1,2,8,9,10	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	1,2,3,8,9,10	1
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	1,2,3,8,9,10	1
C212.4	Discuss the internal functional blocks and applications of special ICs 555, 566, 565, and AD633 ICs.										IV	K2	1,2,8,9,10	1
C212.5	Explain the operation of voltage regulator ICs namely LM78XX, LM79XX, LM317 and LM723.										V	K2	1,2,8,9,10	1
C212.6	Discuss the operation of $\mu$ A78S40 switching regulator, LM 380 power amplifier and ICL 8038 function generator IC.										V	K2	1,2,8,9,10	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C212.2	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C212.3	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C212.4	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C212.5	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C212.6	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C212	2	1	-	-	-	-	-	2	2	2	-	-	1	1

Course Name : MEASUREMENTS AND INSTRUMENTATION										Course Code : 20EE404				
CO	Course Outcomes									Unit	K –CO	POs	PSOs	
C213.1	Apply the knowledge of Engineering fundamentals to compute the different statistical parameters.									I	K3	1,2,3,8,9,10	1,2	
C213.2	Explain the concepts of fundamentals of Electrical and Electronic instruments									II	K2	1,2,8,9,10	1,2	
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	1,2,3,8,9,10	1,2	
C213.4	Discuss the concepts of transformer ratio bridge and self balancing bridge.									III	K2	1,2,8,9,10	1,2	
C213.5	Explain the various storage and display devices.									IV	K2	1,2,8,9,10	1,2	
C213.6	Explain the construction and working of different types of transducer.									V	K2	1,2,8,9,10	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C213.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C213.3	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C213.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C213.5	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C213.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C213	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : ENVIRONMENTAL SCIENCE AND ENGINEERING										Course Code : 20HS401				
CO	Course Outcomes									Unit	K –CO	POs	PSOs	
C214.1	Describe the environment, ecosystem and their significances.									I	K2	6,7	-	
C214.2	Explain the threats to biodiversity.									I	K2	6,7	-	
C214.3	Describe the sources, effects, control methods of environmental pollution.									II	K2	6,7	-	
C214.4	Explain the knowledge on various natural resources and its effect on environment due to over utilization.									III	K2	6,7	-	
C214.5	Describe the disposal techniques of solid waste and record the consequences of natural disasters.									IV	K2	6,7	-	
C214.6	Outline the social issues as welfare, sustainability etc., and relate with population growth.									V	K2	6,7	-	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214.2	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214.3	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214.4	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214.5	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214.6	-	-	-	-	-	2	3	-	-	-	-	-	-	-
C214	-	-	-	-	-	2	3	-	-	-	-	-	-	-

Course Name : ELECTRICAL MACHINES LABORATORY – II										Course Code : 20EE4L1				
CO	Course Outcomes									EXP	K –CO	POs	PSO	
C215.1	Analyze the variation of voltage regulation of synchronous generator for different power factor and different load in different methods									1,2,3	K4	1,2,3,4,9	1,2	
C215.2	Analyze the variation of armature current and power factor of synchronous motor for corresponding variation of field excitation and load									4	K4	1,2,3,4,9	1,2	
C215.3	Determine the performance characteristics of single phase , three phase induction motor and Synchronous Reluctance motor									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									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														
CO	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	1
C215	3	2	1	-	-	-	-	-	2	-	-	-	2	1

Course Name : LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY										Course Code : 20EE4L2				
CO	Course Outcomes									EXP	K –CO	POs	PSO	
C216.1	Conduct an experiment to design and implement the combinational logic circuit for the given Boolean function.									1	K3	1,2,3,8,9,10	1,2	
C216.2	Conduct an experiment to 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	1,2,3,8,9,10	1,2	
C216.3	Conduct an experiment to design and implement the Counters and Shift registers.									5,6	K3	1,2,3,8,9,10	1,2	
C216.4	Conduct an experiment to design and testing of Op-Amp circuits (inverting amplifier, non inverting amplifier, adder, comparator, integrator and differentiator).									7,8	K3	1,2,3,8,9,10	1,2	
C216.5	Conduct an experiment to show the astable and monostable mode response using Timer IC NE/SE 555, to show the voltage to frequency characteristics of VCO IC NE/SE 566 and also to demonstrate the variability voltage regulator using IC LM317.									9,10,11	K3	1,2,3,8,9,10	1,2	
C216.6	Analyze the input and output performance of inverting and Non-inverting Amplifier using PSPICE/SIMULINK.									12	K4	1,2,3,4,5,8,9,10	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C216.2	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C216.3	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C216.4	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C216.5	3	2	1	-	-	-	-	-	2	-	-	-	2	1
C216.6	3	3	2	1	1	-	-	-	2	-	-	-	2	1
C216	3	3	2	-	-	-	-	-	2	-	-	-	2	1

Course Name : TECHNICAL SEMINAR										Course Code : 20EE4L3				
CO	Course Outcomes									EXP	K –CO	POs	PSO	
C217.1	Function effectively as on individual and as a member or leader in diverse things and in multidisciplinary setting									-	K3	8,9,10,12	2	
C217.2	Communicate effectively an engineering activities									-	K3	8,9,10,12	2	
C217.3	Able to comprehend and write effective reports									-	K3	8,9,10,12	2	
C217.4	Make effective presentation									-	K3	8,9,10,12	2	
C217.5	Have the preparation and ability to engage in independent and lifelong learning									-	K3	8,9,10,12	2	
C217.6	Apply ethical principle and commit to professional ethics in presenting technical videos/PPT.									-	K3	8,9,10,12	2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C217.1	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217.2	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217.3	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217.4	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217.5	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217.6	-	-	-	-	-	-	-	2	2	2	-	2	-	2
C217	-	-	-	-	-	-	-	2	2	2	-	2	-	2

Course Name : POWER SYSTEM ANALYSIS											Course Code : 20EE501			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C301.1	Apply the mathematical and engineering knowledge to form bus admittance matrix and impedance matrix										I	K3	1,2,3,6,7,8,9,12	1,2
C301.2	Apply Gauss-Seidel and Newton Raphson methods to solve the load flow problem										II	K3	1,2,3	1,2
C301.3	Analyze the power system under steady state symmetrical fault										III	K4	1,2,3,4,6,7,8,9,12	1,2
C301.4	Analyze the power system under unsymmetrical faults										IV	K4	1,2,3,4,6,7,8,9,12	1,2
C301.5	Analyze the transient stability of the power system using equal area criterion										V	K4	1,2,3,4	1,2
C301.6	Analyze the transient stability of the power system using swing equation										V	K4	1,2,3,4	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	2	1	-	-	1	1	2	1	-	-	1	2	2
C301.2	3	2	1	-	-	-	-	-	-	-	-	-	2	2
C301.3	3	3	2	1	-	1	1	2	1	-	-	1	2	2
C301.4	3	3	2	1	-	1	1	2	1	-	-	1	2	2
C301.5	3	3	2	1	-	-	-	-	-	-	-	-	2	2
C301.6	3	3	2	1	-	-	-	-	-	-	-	-	2	2
C301	3	3	2	1	-	1	1	2	1	-	-	1	2	2

Course Name : POWER ELECTRONICS											Course Code : 20EE502			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C302.1	Explain the significance of switching devices and its application to power converters and its characteristics										I	K2	1,2,8,9,10	1,2
C302.2	Apply the knowledge of engineering fundamentals to derive the performance parameters of 2 pulse, 3 pulse and 6 pulse converter										II	K3	1,2,3,8,9,10	1,2
C302.3	Apply the knowledge of engineering fundamentals to derive the performance analysis of Buck, Boost, Buck-Boost converters										III	K3	1,2,3,8,9,10	1,2
C302.4	Explain the operation of single phase and three phase Voltage Source Inverters and Current Source Inverters										IV	K2	1,2,8,9,10	1,2
C302.5	Explain the operation of single & three phase AC Voltage controllers										V	K2	1,2,8,9,10	1,2
C302.6	Explain the operation of single & three phase Cyclo converters										V	K2	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C302.2	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C302.3	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C302.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C302.5	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C302.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C302	3	1	1	-	-	-	-	2	2	2	-	-	2	1

Course Name : POWER ELECTRONICS											Course Code : 20EE502			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C302.1	Explain the significance of switching devices and its application to power converters and its characteristics										I	K2	1,2	1
C302.2	Compare the operation of two, three Pulse Converters and draw output waveforms with and without source and load inductance										II	K2	1,2	1
C302.3	Apply the knowledge of engineering fundamentals to develop the expression for DC-DC converters										III	K3	1,2,3	1
C302.4	Analyze the operation of single phase and three phase Inverters										IV	K4	1,2,3,4	1
C302.5	Explain the operation of different modulation Techniques of PWM inverters.										IV	K4	1,2,3,4	1
C302.6	Explain the operation of single & three phase AC Voltage controller and cyclo converters										V	K2	1,2	1



Course Name : Microprocessors, Microcontrollers And Applications										Course Code : 20EE505				
CO	Course Outcomes									Unit	K-CO	POs	PSOs	
C305.1	Develop and execute programs in 8086 microprocessor.									I	K3	1,2,3,8,9,10	1,2	
C305.2	Explain the System Bus structure of 8086 microprocessor.									II	K2	1,2,8,9,10	1,2	
C305.3	Illustrate the interfacing of peripheral with microprocessor and microcontroller									III	K2	1,2,8,9,10	1,2	
C305.4	Explain the architecture and Interrupt structure of 8051.									III	K2	1,2,8,9,10	1,2	
C305.5	Design microcontroller based Temperature control and stepper motor control system.									IV	K3	1,2,3,8,9,10	1,2	
C305.6	Explain the architecture of ARM processor.									V	K2	1,2,8,9,10	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C305.2	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C305.3	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C305.4	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C305.5	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C305.6	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C305	2	1	-	-	-	-	-	2	2	2	-	-	1	1

Course Name : CONSTITUTION OF INDIA										Course Code : 20MC501				
CO	Course Outcomes									Unit	K-CO	POs	PSOs	
C319.1	Explain history and philosophy of Indian Constitution.									I	K2	6,8,9,10	-	
C319.2	Explain the premises informing the twin themes of liberty and freedom from a civil rights perspective.									II	K2	6,8,9,10	-	
C319.3	Explain the powers and functions of Indian government									III	K2	6,8,9,10	-	
C319.4	Explain the emergency rules of Indian Constitution.									IV	K2	6,8,9,10	-	
C319.5	Explain the structure and functions of local administration.									V	K2	6,8,9,10	-	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C319.1	-	-	-	-	-	3	-	2	2	2	-	-	2	-
C319.2	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C319.3	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C319.4	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C319.5	-	-	-	-	-	3	-	2	2	2	-	-	2	-
C319	-	-	-	-	-	3	-	2	2	2	-	-	2	-

Course Name : CONSTITUTION OF INDIA										Course Code : 20MC501					
CO	Course Outcomes									Unit	K-CO	POs	PSOs		
C307.1	Explain history and philosophy of Indian Constitution.									I	K2	6,8,9,10	-		
C307.2	Explain the premises informing the twin themes of liberty and freedom from a civil rights perspective.									II	K2	6,8,9,10	-		
C307.3	Explain the powers and functions of Indian government									III	K2	6,8,9,10	-		
C307.4	Explain the emergency rules of Indian Constitution.									IV	K2	6,8,9,10	-		
C307.5	Explain the structure and functions of local administration.									V	K2	6,8,9,10	-		
CO-PO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C307.1	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-
C307.2	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-
C307.3	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-
C307.4	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-
C307.5	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-
C307	-	-	-	-	-	3	-	2	2	2	-	-	-	-	-



Course Name : POWER QUALITY										Course Code : 20EEV11				
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C306V1.1	Explain power quality disturbances, their causes, detrimental effects and Power quality standard.										I	K3	1,2,3,8,9,10	1,2
C306V1.2	Describe the impact of voltage sag and interruptions in power systems.										II	K3	1,2,3,8,9,10	1,2
C306V1.3	Analyze the over voltage phenomena using PSCAD and EMTP.										III	K4	1,2,3,4,8,9,10	1,2
C306V1.4	Describe the impact of Harmonics in power systems.										IV	K3	1,2,3,8,9,10	1,2
C306V1.5	Explain the different types of monitoring devices/methods for power quality in power system.										V	K3	1,2,3,8,9,10	1,2
C306V1.6	Discuss the different types of custom power devices for enhancement of power quality in power system.										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306V1.1	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C306V1.2	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C306V1.3	3	3	2	1	-	-	-	3	3	3	-	-	2	2
C306V1.4	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C306V1.5	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C306V1.6	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C306V1	3	2	1	-	-	-	-	2	2	2	-	-	2	2

Course Name : CONTROL AND INSTRUMENTATION LABORATORY										Course Code : 20EE5L1				
CO	Course Outcomes										Exp	K –CO	POs	PSOs
C307.1	Analyze the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system using MATLAB.										1,2	K4	1,2,3,4,5,9	1
C307.2	Compute the transfer function of a Field controlled DC motor experimentally and analyze the response of Lag, Lead and Lag-Lead Compensators.										3,4	K3	1,2,3,9	1
C307.3	Analyze the transient response of Position Control system experimentally and analyze the Characteristics of Synchro - Transmitter-Receiver.										5,6	K4	1,2,3,4,9	1
C307.4	Use MATLAB for the Simulation of Control Systems.										7	K3	1,2,3,5,9	1
C307.5	Analyze the basic concepts of bridge networks and to analyze the Dynamics of Sensors/Transducers.										8,9	K4	1,2,3,4,9	1
C307.6	Measure the Power and Energy experimentally and analyze signal conditioning circuits.										10,11	K4	1,2,3,4,9	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	3	2	1	2	-	-	-	2	-	-	-	2	-
C307.2	3	2	1	-	-	-	-	-	2	-	-	-	2	-
C307.3	3	3	2	1	-	-	-	-	2	-	-	-	2	-
C307.4	3	2	1	-	2	-	-	-	2	-	-	-	2	-
C307.5	3	3	2	1	-	-	-	-	2	-	-	-	2	-
C307.6	3	3	2	1	-	-	-	-	2	-	-	-	2	-
C307	3	3	2	1	-	-	-	-	2	-	-	-	2	-

Course Name : Microprocessors And Microcontrollers Laboratory											Course Code : 20EE5L2			
CO	Course Outcomes										Exp	K-CO	POs	PSOs
C308.1	Develop an assembly language program for arithmetic, Logical operations using 8086 processor also Move a data block without overlap.										1,2	K3	1,2,3,5,9,10	1,2
C308.2	Develop program for code conversion, decimal arithmetic, Matrix operations and Floating point operations.										3,4	K3	1,2,3,5,9,10	1,2
C308.3	Develop program for Counters and Time Delay and Traffic light controller.										5,6	K3	1,2,3,5,9,10	1,2
C308.4	Develop programs for serial communication and Stepper motor control										7,8	K3	1,2,3,5,9,10	1,2
C308.5	Demonstrate the program of Serial interface, Parallel interface, A/D, D/A interface and Waveform Generation										9,10	K3	1,2,3,5,9,10	1,2
C308.6	Develop an assembly language program for arithmetic, Logical operations, Square and Cube program, Find 2's complement of a number using 8051 microcontroller.										11,12	K3	1,2,5,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	3	2	1	-	1	-	-	-	2	2	-	-	2	1
C308.2	3	2	1	-	1	-	-	-	2	2	-	-	2	1
C308.3	3	2	1	-	1	-	-	-	2	2	-	-	2	1
C308.4	3	2	1	-	1	-	-	-	2	2	-	-	2	1
C308.5	3	2	1	-	1	-	-	-	2	2	-	-	2	1
C308.6	2	1	-	-	1	-	-	-	2	2	-	-	1	1
C308	3	2	1	-	1	-	-	-	2	2	-	-	2	1

Course Name : PROFESSIONAL COMMUNICATION LABORATORY											Course Code : 20HS4L2			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C309.1	Express ideas and concepts on par global communication										1,2	K3	9,10,12	-
C309.2	Involve inter-personal communication with flair and error-free verbatim										3,4	K3	9,10,12	-
C309.3	Face interviews confidently and respond in proper language ability										5,6	K3	9,10,12	-
C309.4	Participate in group discussion and share innovative ideas in technical environments										7,8	K3	9,10,12	-
C309.5	Adapt multi-national exposure on employment										9,10	K3	9,10,12	-
C309.6	Master all-round competency in delivering apt communication for employability										1-10	K3	9,10,12	-
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C309.2	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C309.3	-	-	-	-	-	-	-	-	3	3	-	3	-	-
C309.4	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C309.5	-	-	-	-	-	-	-	-	3	3	-	3	-	-
C309.6	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C309	-	-	-	-	-	-	-	-	2	3	-	3	-	-

Course Name : SOLID STATE DRIVES											Course Code : 20EE601			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C310.1	Explain the basics and importance of electric drives.										I	K2	1,2,8,9,10	1,2
C310.2	Explain the operation of the various converter fed separately excited dc motor drives.										II	K2	1,2,8,9,10	1,2
C310.3	Describe the operation of the various Chopper fed separately excited dc motor drives.										II	K2	1,2,8,9,10	1,2
C310.4	Explain the various solid state speed control methods of induction motor drives.										III	K2	1,2,8,9,10	1,2
C310.5	Discuss the various speed control methods of synchronous motor drives and applications.										IV	K2	1,2,8,9,10	1,2
C310.6	Apply the knowledge of Electrical Engineering fundamentals to develop current and speed controllers for a closed loop solid state dc motor drive.										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C310.2	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C310.3	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C310.4	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C310.5	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C310.6	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C310	2	1	-	-	-	-	-	2	2	2	-	-	1	2

Course Name : SOLID STATE DRIVES											Course Code : 20EEV32			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C314V2.1	Explain the basics and importance of electric drives.										I	K2	1,2,8,9,10	1,2
C314V2.2	Explain the operation of the various converter fed separately excited dc motor drives.										II	K2	1,2,8,9,10	1,2
C314V2.3	Describe the operation of the various Chopper fed separately excited dc motor drives.										II	K2	1,2,8,9,10	1,2
C314V2.4	Explain the various solid state speed control methods of induction motor drives.										III	K2	1,2,8,9,10	1,2
C314V2.5	Discuss the various speed control methods of synchronous motor drives and applications.										IV	K2	1,2,8,9,10	1,2
C314V2.6	Apply the knowledge of Electrical Engineering fundamentals to develop current and speed controllers for a closed loop solid state dc motor drive.										V	K3	1,2,3,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314V2.1	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C314V2.2	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C314V2.3	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C314V2.4	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C314V2.5	2	1	-	-	-	-	-	2	2	2	-	-	1	2
C314V2.6	3	2	1	-	-	-	-	2	2	2	-	-	2	2
C314V2	2	1	-	-	-	-	-	2	2	2	-	-	1	2

Course Name : POWER SYSTEM OPERATION AND CONTROL											Course Code : 20EE602			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C311.1	Apply electrical engineering knowledge to calculate the values of load distribution parameters.										I	K3	1,2,3,6,7,8,9	1,2
C311.2	Analyze the modeling for two area control system with and without controller										II	K4	1,2,3,4,6,7,8,9	1,2
C311.3	Explain various types of excitation system and derive the modeling of AVR										III	K2	1,2	1,2
C311.4	Solve the Unit Commitment problems using priority method										IV	K3	1,2,3,6,7,8,9,12	1,2
C311.5	Solve the Economic Dispatch problems										IV	K3	1,2,3,6,7,8,9,12	1,2
C311.6	Explain the data acquisition and control in power systems and to analyze the contingency of power system										V	K3	1,2,3	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	3	2	1	-	-	1	1	2	1	-	-	-	2	2
C311.2	3	3	2	1	-	1	1	2	1	-	-	-	2	2
C311.3	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C311.4	3	2	1	-	-	1	1	2	2	-	-	1	2	2
C311.5	3	2	1	-	-	1	1	2	2	-	-	1	2	2
C311.6	3	2	1	-	-	-	-	-	-	-	-	-	2	2
C311	3	2	1	1	-	1	1	2	1	-	-	1	2	2

Course Name : POWER SYSTEM OPERATION AND CONTROL											Course Code : 20EE602			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C310.1	Apply electrical engineering knowledge to calculate the values of load distribution parameters.										I	K3	1,2,3,6,7,8,9	1,2
C310.2	Analyze the modeling for two area control system with and without controller										II	K4	1,2,3,4,6,7,8,9	1,2
C310.3	Explain various types of excitation system and derive the modeling of AVR										III	K2	1,2	1,2
C310.4	Solve the Unit Commitment problems using priority method										IV	K3	1,2,3,6,7,8,9,12	1,2
C310.5	Solve the Economic Dispatch problems										IV	K3	1,2,3,6,7,8,9,12	1,2
C310.6	Explain the data acquisition and control in power systems and to analyze the contingency of power system										V	K3	1,2,3	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	3	2	1	-	-	1	1	2	1	-	-	-	2	2
C310.2	3	3	2	1	-	1	1	2	1	-	-	-	2	2
C310.3	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C310.4	3	2	1	-	-	1	1	2	2	-	-	1	2	2
C310.5	3	2	1	-	-	1	1	2	2	-	-	1	2	2
C310.6	3	2	1	-	-	-	-	-	-	-	-	-	2	2
C310	3	2	1	1	-	1	1	2	1	-	-	1	2	2

Course Name : EMBEDDED SYSTEMS											Course Code : 20EE603			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C312.1	Explain the basic build process of embedded systems										I	K2	1,2,8,9,10	1,2
C312.2	Describe the different types of I/O device ports, buses and different interfaces for data transfer in embedded networking										II	K2	1,2,8,9,10	1,2
C312.3	Explain the interrupt service mechanism and device drivers.										III	K2	1,2,8,9,10	1,2
C312.4	Explain the basic concept of Real Time Operating Systems										IV	K2	1,2,8,9,10	1,2
C312.5	Apply the knowledge of programming concepts of Embedded Systems for various applications										V	K3	1,2,3,8,9,10	1,2
C312.6	Explain the different phases and modeling of the EDLC.										V	K2	1,2,8,9,10	1,2
C312.7	Apply modern Engineering tool assess societal issues, ethical principles, work in multidisciplinary settings and to engage in life long learning for the assigned activity- case study										-	-	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C312.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C312.3	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C312.4	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C312.5	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C312.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C312	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : EMBEDDED SYSTEM DESIGN											Course Code : 20EEV34			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C314V4.1	Explain the basic build process of embedded systems										I	K2	1,2,8,9,10	1,2
C314V4.2	Describe the different types of I/O device ports, buses and different interfaces for data transfer in embedded networking										II	K2	1,2,8,9,10	1,2
C314V4.3	Explain the interrupt service mechanism and device drivers.										III	K2	1,2,8,9,10	1,2
C314V4.4	Explain the basic concept of Real Time Operating Systems										IV	K2	1,2,8,9,10	1,2
C314V4.5	Apply the knowledge of programming concepts of Embedded Systems for various applications										V	K3	1,2,3,8,9,10	1,2
C314V4.6	Explain the different phases and modeling of the EDLC.										V	K2	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314V4.1	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C314V4.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C314V4.3	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C314V4.4	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C314V4.5	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C314V4.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C314V4	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : OBJECT ORIENTED PROGRAMMING											Course Code : 20IT301			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C313.1	Realize the Object-Oriented Programming concepts and Basics of java Programming tool.										I	K3	1,2,3	1
C313.2	Apply the concepts of inheritance and interfaces using java programs										II	K3	1,2,3	1
C313.3	Construct java exceptions and I/O streams										III	K3	1,2,3	1
C313.4	Illustrate multithread concepts and generics in java										IV	K3	1,2,3	1
C313.5	Design and develop interactive java application using AWT										V	K3	1,2,3	1
C313.6	Design and develop interactive java application using Swing										V	K3	1,2,3	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313.2	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313.3	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313.4	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313.5	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313.6	3	2	1	-	-	-	-	-	-	-	-	-	3	-
C313	3	2	1	-	-	-	-	-	-	-	-	-	3	-

Course Name : OBJECT ORIENTED PROGRAMMING											Course Code : 20IT301			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C311.1	Realize the Object-Oriented Programming concepts and Basics of java Programming tool.										I	K3	1,2,3,5,9,10	1
C311.2	Apply the concepts of inheritance and interfaces using java programs										II	K3	1,2,3,5,9,10	1
C311.3	Construct java exceptions and I/O streams										III	K3	1,2,3,5,9,10	1
C311.4	Illustrate multithread concepts and generics in java										IV	K3	1,2,3,5,9,10	1
C311.5	Design and develop interactive java application using AWT										V	K3	1,2,3,5,9,10	1
C311.6	Design and develop interactive java application using Swing										V	K3	1,2,3,5,9,10	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311.2	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311.3	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311.4	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311.5	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311.6	3	2	1	-	3	-	-	-	2	2	-	-	3	1
C311	3	2	1	-	3	-	-	-	2	2	-	-	3	1

Course Name : ELECTRIC VEHICLES AND POWER MANAGEMENT											Course Code : 20EEV23			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C313V3.1	Demonstrate the operation of Electric vehicles and various energy storage technologies for electrical vehicles										I	K2	1,2,8,9,10	1,2
C313V3.2	Explain the Architecture of EV's and Power Train Components										II	K2	1,2,8,9,10	1,2
C313V3.3	Discuss the Control of DC drives										III	K2	1,2,8,9,10	1,2
C313V3.4	Describe the Control of AC drives										III	K2	1,2,8,9,10	1,2
C313V3.5	Explain about various types of Battery energy storage system										IV	K2	1,2,8,9,10	1,2
C313V3.6	Generalize the Alternative energy storage system										V	K2	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313V3.1	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3.2	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3.3	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3.4	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3.5	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3.6	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C313V3	2	1	-	-	-	-	-	2	2	2	-	-	1	1

Course Name : ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE											Course Code : 20MC601			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C320.1	Explain philosophy of Indian culture.										I	K2	6,8,9,10	-
C320.2	Distinguish the Indian languages and literature.										II	K2	6,8,9,10	-
C320.3	Explain the philosophy of ancient, medieval and modern India.										III	K2	6,8,9,10	-
C320.4	Acquire the information about the fine arts in India.										IV	K2	6,8,9,10	-
C320.5	Explain education systems in India										V	K2	6,8,9,10	-
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C320.1	-	-	-	-	-	3	-	2	2	2	-	-	2	-
C320.2	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C320.3	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C320.4	-	-	-	-	-	3	-	2	2	2	-	-	1	-
C320.5	-	-	-	-	-	3	-	2	2	2	-	-	2	-
C320	-	-	-	-	-	3	-	2	2	2	-	-	2	-





Course Name : SPECIAL ELECTRICAL MACHINES											Course Code : 20EE6B2			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C315B2.1	Explain the construction and Principle of operation of stepper motor										I	K2	1,2,8,9,10	1,2
C315B2.2	Discuss the construction and Principle of operation of SRM										II	K2	1,2,8,9,10	1,2
C315B2.3	Describe the construction and Principle of operation of Permanent Magnet Brushless DC Motor										III	K2	1,2,8,9,10	1,2
C315B2.4	Explain the operation Microprocessor Based controller for PMBLDC										III	K2	1,2,8,9,10	1,2
C315B2.5	Discuss the Principle of operation of Permanent Magnet Synchronous Motor										IV	K2	1,2,8,9,10	1,2
C315B2.6	Describe the construction and Principle of operation of Synchronous Reluctance Motors										V	K2	1,2,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315B2.1	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2.3	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2.5	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C315B2	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : SPECIAL ELECTRICAL MACHINES											Course Code : 20EEV22			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C313V2.1	Explain the construction and Principle of operation of stepper motor										I	K2	1,2	1
C313V2.2	Discuss the construction and Principle of operation of SRM										II	K2	1,2	1
C313V2.3	Describe the construction and Principle of operation of Permanent Magnet Brushless DC Motor										III	K2	1,2	1
C313V2.4	Explain the operation Microprocessor Based controller for PMBLDC										III	K2	1,2	1
C313V2.5	Discuss the Principle of operation of Permanent Magnet Synchronous Motor										IV	K2	1,2	1
C313V2.6	Describe the construction and Principle of operation of Synchronous Reluctance Motors										V	K2	1,2	1
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313V2.1	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2.3	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2.5	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C313V2	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : POWER ELECTRONIC CONVERTERS FOR ELECTRIC VEHICLE										Course Code : 20EEV13				
CO	Course Outcomes									Unit	K –CO	POs	PSOs	
C306V3.1	Explain the basics of various power electronics devices suitable for electric vehicles.									I	K2	1,2,8,9,10	1,2	
C306V3.2	Explain the operation of DC-DC Converters used in electric vehicles									II	K2	1,2,8,9,10	1,2	
C306V3.3	Explain the operation of rectifiers and inverters used in electric vehicles									III	K2	1,2,8,9,10	1,2	
C306V3.4	Explain the various DC motor drives suitable for EV									IV	K2	1,2,8,9,10	1,2	
C306V3.5	Explain the various AC motor drives suitable for EV									IV	K2	1,2,8,9,10	1,2	
C306V3.6	Explain the Electric Propulsion unit of Electric vehicles									V	K2	1,2,8,9,10	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306V3.1	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3.2	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3.3	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3.4	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3.5	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3.6	2	1	-	-	-	-	-	2	2	2	-	-	2	1
C306V3	2	1	-	-	-	-	-	2	2	2	-	-	2	1

Course Name : Power Electronics And Drives Laboratory										Course Code : 20EE6L1				
CO	Course Outcomes									Exp	K –CO	POs	PSOs	
C316.1	Conduct on experiment to generate the gate pulse of SCR using R, RC and UJT triggering circuit and differentiate the VI characteristics of power electronics devices.									1,2,3	K3	1,2,3,9	1,2	
C316.2	Conduct on experiment to analyze the performance of the designed single phase AC to DC semi converter and fully controlled converter with R and RL load using MATLAB simulation tool.									4,5	K4	1,2,3,4,5,9	1,2	
C316.3	Conduct on experiment to analyze the performance of the designed step down and step up MOSFET based choppers using MATLAB simulation tool.									6	K4	1,2,3,4,5,9	1,2	
C316.4	Conduct on experiment to analyze the performance of the designed AC –AC converters and Switched mode power converter using MATLAB simulation tool.									7,8	K4	1,2,3,4,5,9	1,2	
C316.5	Conduct on experiment to show the frequency response of single phase PWM inverter and inverter fed induction motor drive.									9,10	K3	1,2,3,9	1,2	
C316.6	Demonstrate the speed control of the given Micro controller based DC drive by conducting suitable experiment.									11	K3	1,2,3,9	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	3	2	1	-	-	-	-	-	2	-	-	-	2	2
C316.2	3	3	2	1	1	-	-	-	2	-	-	-	2	2
C316.3	3	3	2	1	1	-	-	-	2	-	-	-	2	2
C316.4	3	3	2	1	1	-	-	-	2	-	-	-	2	2
C316.5	3	2	1	-	-	-	-	-	2	-	-	-	2	2
C316.6	3	2	1	-	-	-	-	-	2	-	-	-	2	2
C316	3	2	1	-	-	-	-	-	2	-	-	-	2	2



Course Name : Object Oriented And Java Programming Laboratory											Course Code : 20CS6L3			
CO	Course Outcomes										Exp	K-CO	POs	PSOs
C318.1	Develop and implement Java programs for simple applications that make use of classes, packages.										1,2	K3	1,2,3,5,8,9,10	1,2
C318.2	Develop and implement Java programs with inheritance and interfaces.										3,4	K3	1,2,3,5,8,9,10	1,2
C318.3	Develop Java programs to implement function polymorphism.										5,6	K3	1,2,3,5,8,9,10	1,2
C318.4	Develop simple java programs with use of files and exceptions.										7,8	K3	1,2,3,5,8,9,10	1,2
C318.5	Develop simple java programs by implementing multithread concepts.										9,10	K3	1,2,3,5,8,9,10	1,2
C318.6	Develop simple java program by using generic concepts.										11,12	K3	1,2,3,5,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C318.1	3	2	1	-	3	-	-	1	1	1	-	-	3	2
C318.2	3	2	1	-	3	-	-	1	1	1	-	-	3	2
C318.3	3	2	1	-	3	-	-	1	1	1	-	-	3	2
C318.4	3	2	1	-	3	-	-	1	1	1	-	-	3	2
C318.5	3	2	1	-	3	-	-	1	1	1	-	-	3	2
C318.6	3	3	1	-	3	-	-	1	1	1	-	-	3	3
C318	3	3	1	-	3	-	-	1	1	1	-	-	3	3

Course Name : PROTECTION AND SWITCHGEAR											Course Code : 20EE701			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C401.1	Explain the Over voltage Protection of Power Systems										1	K2	1,2	1,2
C401.2	Explain the characteristics and functions of Electromagnetic type protective relays										2	K2	1,2	1,2
C401.3	Describe the various abnormal conditions in power system apparatus and to select a suitable protection scheme										3	K2	1,2	1,2
C401.4	Develop assembly language programming for numerical over current, directional and distance protection										4	K3	1,2,3,5,8,12	1,2
C401.5	Analyze the circuit interruption problems										5	K4	1,2,3,4	1,2
C401.6	Explain the operation of Air, Oil, SF6 and Vacuum Circuit Breakers										5	K2	1,2	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C401.2	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C401.3	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C401.4	3	2	1	-	2	-	-	2	-	-	-	2	3	3
C401.5	3	3	2	1	-	-	-	-	-	-	-	-	3	3
C401.6	2	1	-	-	-	-	-	-	-	-	-	-	2	2
C401	2	1	-	-	-	-	-	-	-	-	-	-	2	2

Course Name : RENEWABLE ENERGY SYSTEMS											Course Code : 20EE702			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
C402.1	Describe about renewable Energy Sources and technologies. Outline the Environmental consequences of fossil fuel use										I	K2	1,2,7,8	1,2
C402.2	Discuss the basic principle and types of solar PV system and thermal energy systems										II	K2	1,2,7,8	1,2
C402.3	Explain the basic principles, types and Grid integration issues of Wind Energy Conversion Systems										III	K2	1,2,7,8	1,2
C402.4	Summarize the electrical power from bio-mass energy and Hydro energy										IV	K2	1,2,7,8	1,2
C402.5	Describe the electrical power from geothermal energy, Ocean energy, Hydrogen energy and Fuel cell.										V	K2	1,2,7,8	1,2
C402.6	Explain the different types of Hybrid energy systems with their advantages and disadvantages										V	K2	1,2,7,8	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402.2	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402.3	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402.4	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402.5	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402.6	2	1	-	-	-	-	3	3	-	-	-	-	2	1
C402	2	1	-	-	-	-	3	3	-	-	-	-	2	1

Course Name : FIBRE OPTICS AND LASER INSTRUMENTS		Course Code : 20EE7A1			
CO	Course Outcomes	Unit	K –CO	POs	PSOs
C404A5.1	Explain the principle, transmission, dispersion and attenuation characteristics of optical fibers	I	K2	1,2,8,9,10	1,2
C404A5.2	Explain the principle of Fibre Optical sources and Optical detectors.	I	K2	1,2,8,9,10	1,2
C404A5.3	Illustrate the optical fibers for its use as communication medium and as sensor as well which have important applications in production, manufacturing industrial and biomedical applications.	II	K2	1,2,8,9,10	1,2
C404A5.4	Describe the Fiber Scattering loss Measurement, Fiber Absorption Measurement and Fiber dispersion measurements	II	K2	1,2,8,9,10	1,2
C404A5.5	Discuss the laser theory and laser generation system.	IV	K2	1,2,8,9,10	1,2
C404A5.6	Explain the laser theory for the selection of lasers for a specific Industrial and medical application.	V	K2	1,2,8,9,10	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404A5.1	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5.2	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5.3	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5.4	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5.5	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5.6	2	1	-	-	-	-	-	2	2	1	-	-	1	1
C404A5	2	1	-	-	-	-	-	2	2	1	-	-	1	1

Course Name : COMPUTER ORGANIZATION AND ARCHITECTURE		Course Code : 20CS401			
CO	Course Outcomes	Unit	K –CO	POs	PSOs
C405B5.1	Explain the computer organization components, instructions and addressing modes.	I	K2	1,2	1
C405B5.2	Compute the arithmetic operations such as Addition, Subtraction, Multiplication and Division.	II	K3	1-3,8,9	1
C405B5.3	Discuss the basics of MIPS implementation and pipelining.	III	K2	1,2,8-10,12	1
C405B5.4	Illustrate the basic concepts of parallelism, multi-core processor, GPU & Clusters.	IV	K2	1,2,8,9,12	1
C405B5.5	Describe the memory technologies & I/O systems.	V	K2	1,2,8-10,12	1
C405B5.6	Utilize Raspberry-pi for demonstrating memory systems.	V	K3	1-3,5,8,9,12	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405B5.1	2	1	-	-	-	-	-	-	-	-	-	-	2	-
C405B5.2	3	2	1	-	-	-	-	1	1	-	-	-	3	1
C405B5.3	2	1	-	-	-	-	-	1	1	1	-	1	2	1
C405B5.4	2	1	-	-	-	-	-	1	1	-	-	1	2	1
C405B5.5	2	1	-	-	-	-	-	1	1	1	-	1	2	1
C405B5.6	3	2	1	-	1	-	-	1	1	-	-	1	2	1
C405B5	3	1	-	-	-	-	-	1	1	-	-	1	2	1

Course Name: Electric Energy Generation, Utilization And Conservation		Course Code: 20EEV61			
CO	Course Outcomes	Unit	K –CO	POs	PSOs
C4V61.1	Describe the basic principles & technologies of various renewable and nonrenewable energy resource-based power generation	I	K2	1,2,8,9,10	1,2
C4V61.2	Categorize different light sources and design various illumination systems for the indoor lighting schemes, factory lighting, halls, outdoor lighting schemes, flood lighting, street lighting	II	K4	1,2,3,4,8,9,10	1,2
C4V61.3	Classify different methods of electric heating and electric welding in industries.	III	K3	1,2,3,8,9,10	1,2
C4V61.4	Compute the tractive effort for the propulsion of train, name the traction motors, list the traction motor control, track equipment and collection gear.	IV	K3	1,2,3,8,9,10	1,2
C4V61.5	Describe the selection of electrical drives based on the industrial applications.	IV	K2	1,2,8,9,10	1,2
C4V61.6	Explain the concept of Air conditioner and refrigerator.	V	K2	1,2,8,9,10	1,2

#### CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C4V61.1	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C4V61.2	3	3	2	1	-	-	-	2	2	2	-	-	3	1
C4V61.3	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C4V61.4	3	2	1	-	-	-	-	2	2	2	-	-	2	1
C4V61.5	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C4V61.6	2	1	-	-	-	-	-	2	2	2	-	-	1	1
C4V61	2	1	-	-	-	-	-	2	2	2	-	-	1	1

COURSE NAME : POWER SYSTEM SIMULATION LABORATORY		Course Code : 20EE7L1			
CO	Course Outcomes	Exp	K –CO	POs	PSOs
C406.1	Develop coding to determine the various line parameters of a transmission line.	1	K3	1,2,3,4,5,8,9,10,12	1,2
C406.2	Develop coding to form bus admittance matrix for the given power system network.	2	K3	1,2,3,4,5,8,9,10,12	1,2
C406.3	Develop program to determine the line losses of the given power system network.	3,4	K3	1,2,3,4,5,8,9,10,12	1,2
C406.4	Develop simulink model for fault analysis in the transmission line using bus impedance matrix.	5	K4	1,2,3,4,5,8,9,10,12	1,2
C406.5	Develop the coding to solve the economic dispatch problem in Power system.	7	K3	1,2,3,4,5,8,9,10,12	1,2
C406.6	Analyze the steady state and Transient stability of the given power system using simulation	6,8,9,10	K4	1,2,3,4,5,8,9,10,12	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C406.2	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C406.3	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C406.4	3	3	2	1	2	-	-	1	1	1	-	1	3	3
C406.5	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C406.6	3	3	2	1	2	-	-	1	1	1	-	1	3	3
C406	3	2	1	-	2	-	-	1	1	1	-	1	3	3

COURSE NAME :POWER SYSTEM SIMULATION LABORATORY		Course Code : 20EE7L1			
CO	Course Outcomes	Exp	K –CO	POs	PSOs
C407.1	Develop coding to determine the various line parameters of a transmission line.	1	K3	1,2,3,4,5,8,9,10,12	1,2
C407.2	Develop coding to form bus admittance matrix for the given power system network.	2	K3	1,2,3,4,5,8,9,10,12	1,2
C407.3	Develop program to determine the line losses of the given power system network.	3,4	K3	1,2,3,4,5,8,9,10,12	1,2
C407.4	Develop simulink model for fault analysis in the transmission line using bus impedance matrix.	5	K4	1,2,3,4,5,8,9,10,12	1,2
C407.5	Develop the coding to solve the economic dispatch problem in Power system.	7	K3	1,2,3,4,5,8,9,10,12	1,2
C407.6	Analyze the steady state and Transient stability of the given power system using simulation	6,8,9,10	K4	1,2,3,4,5,8,9,10,12	1,2

**CO-PO Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C407.2	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C407.3	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C407.4	3	3	2	1	2	-	-	1	1	1	-	1	3	3
C407.5	3	2	1	-	2	-	-	1	1	1	-	1	3	3
C407.6	3	3	2	1	2	-	-	1	1	1	-	1	3	3
C407	3	3	2	1	2	-	-	1	1	1	-	1	3	3



Course Name : RENEWABLE ENERGY SYSTEMS LABORATORY										Course Code : 20EE7L2				
CO	Course Outcomes									Exp	K –CO	POs	PSOs	
C407.1	Analyze VI-Characteristics and Efficiency of 1kWp Solar PV System									2	K4	1,2,3,4,5,9,12	1,2	
C407.2	Analyze the Shadowing effect & diode based solution in 1kWp Solar PV System									3	K4	1,2,3,4,5,9,12	1,2	
C407.3	Analyze the Performance of Grid connected and Standalone 1kWp Solar Power System.									4	K4	1,2,3,4,5,9,12	1,2	
C407.4	Simulate the various Renewable energy sources									1,5,7,9,11	K3	1,2,3,4,5,9,12	1,2	
C407.5	Analyze the performance characteristics of micro Wind Energy Generator									6	K4	1,2,3,4,5,9,12	1,2	
C407.6	Analyze the performance characteristics of Hybrid (Solar-Wind) Power System.									8	K4	1,2,3,4,5,9,12	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C407.2	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C407.3	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C407.4	3	2	1	-	1	-	-	-	1	-	-	1	3	3
C407.5	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C407.6	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C407	3	3	2	1	1	-	-	-	1	-	-	1	3	3

Course Name :RENEWABLE ENERGY SYSTEMS LABORATORY										Course Code : 20EE7L2				
CO	Course Outcomes									Exp	K –CO	POs	PSOs	
C408.1	Analyze VI-Characteristics and Efficiency of 1kWp Solar PV System									2	K4	1,2,3,4,5,9,12	1,2	
C408.2	Analyze the Shadowing effect & diode based solution in 1kWp Solar PV System									3	K4	1,2,3,4,5,9,12	1,2	
C408.3	Analyze the Performance of Grid connected and Standalone 1kWp Solar Power System.									4	K4	1,2,3,4,5,9,12	1,2	
C408.4	Simulate the various Renewable energy sources									1,5,7,9,11	K3	1,2,3,4,5,9,12	1,2	
C408.5	Analyze the performance characteristics of micro Wind Energy Generator									6	K4	1,2,3,4,5,9,12	1,2	
C408.6	Analyze the performance characteristics of Hybrid (Solar-Wind) Power System.									8	K4	1,2,3,4,5,9,12	1,2	
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C408.1	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C408.2	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C408.3	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C408.4	3	2	1	-	1	-	-	-	1	-	-	1	3	3
C408.5	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C408.6	3	3	2	1	1	-	-	-	1	-	-	1	3	3
C408	3	3	2	1	1	-	-	-	1	-	-	1	3	3

Course Name : MINI PROJECT-II											Course Code : 20EE7L3			
CO	Course Outcomes										Exp	K-CO	POs	PSOs
C409.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.										-	K4	1-12	1,2
C409.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies										-	K4	1-12	1,2
C409.3	Apply modern engineering tools for solution										-	K4	1-12	1,2
C409.4	Contribute as an individual or in a team in development of technical projects										-	K4	1-12	1,2
C409.5	Develop effective communication skills for presentation of project related activities										-	K4	1-12	1,2
C409.6	Prepare reports and examination following professional ethics										-	K4	1-12	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409.1	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409.2	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409.3	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409.4	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409.5	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409.6	3	3	2	1	1	1	1	1	1	1	1	1	2	2
C409	3	3	2	1	1	1	1	1	1	1	1	1	2	2

Course Name : PROJECT WORK											Course Code : 20EE8P1			
CO	Course Outcomes										Exp	K-CO	POs	PSOs
C410.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.										-	K4	1-12	1,2
C410.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies										-	K4	1-12	1,2
C410.3	Apply modern engineering tools for solution										-	K4	1-12	1,2
C410.4	Contribute as an individual or in a team in development of technical projects										-	K4	1-12	1,2
C410.5	Develop effective communication skills for presentation of project related activities										-	K4	1-12	1,2
C410.6	Prepare reports and examination following professional ethics										-	K4	1-12	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	3	3	2	1	-	3	3	-	-	-	-	3	3	3
C410.2	3	3	2	1	-	-	-	-	-	-	-	-	3	3
C410.3	3	2	1	-	3	-	-	-	-	-	-	-	3	3
C410.4	3	2	1	-	-	-	-	-	3	-	-	-	3	3
C410.5	3	2	1	-	-	-	-	-	-	3	-	-	3	3
C410.6	3	2	1	-	-	-	-	3	-	-	3	-	3	3
C410	3	2	1	-	-	-	-	3	-	-	3	-	3	3

Course Name : PROJECT WORK / INTERNSHIP											Course Code : 20EE8L1			
CO	Course Outcomes										Exp	K-CO	POs	PSOs
C410.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.										-	K4	1-12	1,2
C410.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies										-	K4	1-12	1,2
C410.3	Apply modern engineering tools for solution										-	K4	1-12	1,2
C410.4	Contribute as an individual or in a team in development of technical projects										-	K4	1-12	1,2

<b>C410.5</b>	Develop effective communication skills for presentation of project related activities										-	K4	1-12	1,2
<b>C410.6</b>	Prepare reports and examination following professional ethics										-	K4	1-12	1,2
<b>CO-PO Mapping</b>														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C410.1</b>	3	3	2	1	-	3	3	-	-	-	-	3	3	3
<b>C410.2</b>	3	3	2	1	-	-	-	-	-	-	-	-	3	3
<b>C410.3</b>	3	2	1	-	3	-	-	-	-	-	-	-	3	3
<b>C410.4</b>	3	2	1	-	-	-	-	-	3	-	-	-	3	3
<b>C410.5</b>	3	2	1	-	-	-	-	-	-	3	-	-	3	3
<b>C410.6</b>	3	2	1	-	-	-	-	3	-	-	3	-	3	3
<b>C410</b>	3	2	1	-	-	-	-	3	-	-	3	-	3	3

<b>Course Name : ELECTRIC VEHICLES AND POWER MANAGEMENT</b>											<b>Course Code : 20EE8A2</b>			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
<b>C408A3.1</b>	Explain the operation of Electric vehicles and various energy storage technologies for electrical vehicles										1	K2	1,2,8,9,10	1,2
<b>C408A3.2</b>	Explain the Architecture of EV's and Power Train Components										2	K2	1,2,8,9,10	1,2
<b>C408A3.3</b>	Discuss the Control of DC drives										3	K2	1,2,8,9,10	1,2
<b>C408A3.4</b>	Describe the Control of AC drives										3	K2	1,2,8,9,10	1,2
<b>C408A3.5</b>	Explain about various types of Battery energy storage system										4	K2	1,2,8,9,10	1,2
<b>C408A3.6</b>	Generalize the Alternative energy storage system										5	K2	1,2,8,9,10	1,2
<b>CO-PO Mapping</b>														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C408A3.1</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3.2</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3.3</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3.4</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3.5</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3.6</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C408A3</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1

<b>Course Name : HIGH VOLTAGE ENGINEERING</b>											<b>Course Code : 20EEV51</b>			
CO	Course Outcomes										Unit	K-CO	POs	PSOs
<b>C4V51.1</b>	Identify the causes of over voltage and its effects in power system.										I	K2	1,2,8,9,10	1,2
<b>C4V51.2</b>	Explain the breakdown Mechanisms in Solid, Liquid, gases and Composite dielectrics.										II	K2	1,2,8,9,10	1,2
<b>C4V51.3</b>	Summarize different type of Generating circuit for high voltage D.C and high voltage A.C.										III	K2	1,2,8,9,10	1,2
<b>C4V51.4</b>	Explain the Measurement of A.C and D.C high voltage and current using appropriate method.										IV	K2	1,2,8,9,10	1,2
<b>C4V51.5</b>	Discuss the importance of power apparatus testing in Transient studies.										V	K2	1,2,8,9,10	1,2
<b>C4V51.6</b>	Understand the concept of Insulation coordination.										V	K2	1,2,8,9,10	1,2
<b>CO-PO Mapping</b>														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C4V51.1</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51.2</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51.3</b>	2	2	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51.4</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51.5</b>	2	2	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51.6</b>	2	2	-	-	-	-	-	2	2	2	-	-	1	1
<b>C4V51</b>	2	1	-	-	-	-	-	2	2	2	-	-	1	1

Course Name : ENERGY AUDITING AND MANAGEMENT											Course Code : 20EE8B1			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C409B1.1	Explain the importance of energy management and auditing.										I	K2	1,2,6,7,8,9,10	1,2
C409B1.2	Describe energy management on different types of electrical equipment.										II	K3	1,2,6,7,8,9,10	1,2
C409B1.3	Explain the Forms and feasibility of cogeneration										II	K3	1,2,6,7,8,9,10	1,2
C409B1.4	Discuss the energy management on different types of lighting system and light sources.										III	K3	1,2,6,7,8,9,10	1,2
C409B1.5	Describe the different types of metering methods of energy management and auditing.										IV	K4	1,2,6,7,8,9,10	1,2
C409B1.6	Explain the economic models for energy and load management.										V	K2	1,2,6,7,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409B1.1	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1.2	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1.3	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1.4	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1.5	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1.6	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C409B1	2	1	-	-	-	1	1	2	2	2	-	-	1	1

Course Name : ENERGY AUDITING AND MANAGEMENT											Course Code : 20EEV41			
CO	Course Outcomes										Unit	K –CO	POs	PSOs
C315V1.1	Explain the importance of energy management and auditing.										I	K2	1,2,6,7,8,9,10	1,2
C315V1.2	Describe energy management on different types of electrical equipment.										II	K3	1,2,6,7,8,9,10	1,2
C315V1.3	Explain the Forms and feasibility of cogeneration										II	K3	1,2,6,7,8,9,10	1,2
C315V1.4	Discuss the energy management on different types of lighting system and light sources.										III	K3	1,2,6,7,8,9,10	1,2
C315V1.5	Describe the different types of metering methods of energy management and auditing.										IV	K4	1,2,6,7,8,9,10	1,2
C315V1.6	Explain the economic models for energy and load management.										V	K2	1,2,6,7,8,9,10	1,2
CO-PO Mapping														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315V1.1	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1.2	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1.3	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1.4	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1.5	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1.6	2	1	-	-	-	1	1	2	2	2	-	-	1	1
C315V1	2	1	-	-	-	1	1	2	2	2	-	-	1	1

**20OE403-COMPUTER COMMUNICATION NETWORKS**

<b>Course Outcomes</b>					
<b>CO</b>	<b>CO Statement</b>	<b>Unit</b>	<b>K –CO</b>	<b>POs</b>	<b>PSOs</b>
C306.1	Explain the basic concepts of communication networks	1	K2	1,2	1,2
C306.2	Apply the error detection and error correction methods for bit streams	2	K3	1,2,3,8,9,10	1,2
C306.3	Classify various media access control protocols techniques of communication networks	2	K2	1,2,8,9,10,12	1,2
C306.4	Utilize various types of routing techniques to forward packets	3	K2	1,2,8,9	1,2
C306.5	Illustrate the mechanisms involved in transport layer	4	K2	1,2,8,9,10	1,2
C306.6	Classify different application layer protocols	5	K2	1,2,8,9,10,12	1,2

<b>CO-PO Mapping</b>														
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
C306.1	2	1	-	-	-	-	-	-	-	-	-	-	2	1
C306.2	3	2	1	-	-	-	-	1	1	1	-	-	2	1
C306.3	2	1	-	-	-	-	-	1	1	1	-	1	2	1
C306.4	2	1	-	-	-	-	-	1	1	-	-	-	2	1
C306.5	2	1	-	-	-	-	-	1	1	1	-	-	2	1
C306.6	2	1	-	-	-	-	-	1	1	1	-	1	2	1
C306	2	1	-	-	-	-	-	1	1	1	-	-	2	1

<b>Course Name: Internet Of Things AND Applications</b>		<b>Course Code: 20OE503</b>			
<b>Co</b>	<b>Course Outcomes</b>	<b>Unit</b>	<b>K-CO</b>	<b>POs</b>	<b>PSOs</b>
OE5.3.1	Explain the concept of IOT.	1	K2	1,2,10	
OE5.3.2	Analyze various protocols for IOT.	2	K2	1,2,12	
OE5.3.3	Explain the development board of Raspberry Pi/ Arduino	3	K2	1,2,3,10	1,2
OE5.3.4	Apply data analytics and use cloud offerings related to IOT.	4	K3	1,2,3,12	1,2
OE5.3.5	Analyze the different IOT systems	4	K3	1,2,10	1,2
OE5.3.6	Analyze applications of IOT in real time scenario	5	K4	1,2,3,4,12	1,2

<b>COPO Mapping</b>															
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
OE5.3.1	2	1								1					
OE5.3.2	2	1										1			
OE5.3.3	2	1								1			1	1	
OE5.3.4	3	2	1									1	1	1	
OE5.3.5	3	2	1							1			1	1	
OE5.3.6	3	3	2	1								1	1	1	
OE5.3	3	2	1	-	-	-	-	-	-	-	-	1	1	1	

<b>Course Name: SOLAR PHOTOVOLTAIC FUNDAMENTALS AND APPLICATIONS</b>		<b>Course Code: 20OE105</b>			
<b>CO</b>	<b>Course Outcomes</b>	<b>Unit</b>	<b>K-CO</b>	<b>POs</b>	<b>PSOs</b>
	Summarize the basics of Photovoltaic systems.	I	K2	1,2,3	1,2,3
	Explain the component of stand-alone photovoltaic systems	II	K2	1,2,3	1,2,3
	Explain the component of grid connected photovoltaic systems	III	K2	1,2,3	1,2,3
	Summarize the basics of Hybrid systems.	IV	K2	1,2,3	1,2,3
	Explain the selection criteria for a given Photovoltaic application.	V	K2	1,2,3	1,2,3
	Design of various components of solar PV systems.	V	K3	1,2,3	1,2,3

<b>CO-PO Mapping</b>															
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
	3	2	1	-	-	-	-	-	-	-	-	-	3	2	1
	2	1	1										2	1	1

Course Name: INDUSTRIAL SAFETY PRACTICES		Course Code: 20OE103			
CO	Course Outcomes	Unit	K-CO	POs	PSOs
		I	K3	1,2,3,4,6,10,12	1,2
	Identify and prevent chemical, environmental mechanical, fire hazard.	II	K3	1,2,3,4,6,10,12	1,2
	Collect, analyze and interpret the accidents data based on various safety techniques.	III	K3	1,2,3,4,5,6,10,12	1,2
	Apply proper safety techniques on safety engineering and management.	IV	K3	1,2,3,4,5,6,10,12	1,2
	Perform hazard analysis.	V	K3	1,2,3,4,5,6,10,12	1,2
	Design the system with environmental consciousness by implementing safety regulation.	V	K3	1,2,3,4,6,10,12	1,2

#### CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	3	3	1	1	-	2	-	-	-	1	-	1	2	1	-
	3	3	1	1	-	2	-	-	-	1	-	1	2	1	-
	3	3	1	1	-	2	-	-	-	1	-	1	2	1	-
	3	3	1	1	1	2	-	-	-	1	-	1	2	1	-
	3	3	1	1	1	2	-	-	-	1	-	1	2	1	-
	3	3	1	1	-	2	-	-	-	1	-	1	2	1	-

Course Name: TOTAL QUALITY MANAGEMENT		Course Code: 20HS7A2			
CO	Course Outcomes	Unit	K-CO	POs	PSOs
C409E6.1	Explain basic concepts, TQM framework, Barriers and Benefits of TQM.	I	K3	1,2,3,11	1,2, 3
C409E6.2	Explain the TQM Principles for application.	II	K3	1,2,3,8,11	1,2, 3
C409E6.3	Define the basics of Six Sigma and Traditional tools, New tools, Benchmarking and FMEA.	III	K3	1,2,3,4,5,11,12	1,2, 3
C409E6.4	Describe Taguchi's Quality Loss Function, Performance Measures and apply Techniques like QFD, TPM, COQ and BPR.	IV	K3	1,2,3,4,5,7,11	1,2, 3
C409E6.5	Illustrate and apply QMS and EMS in any organization.	IV	K3	1,2,3,4,11,12	1,2, 3
C409E6.6	Explain the process of implementation of ISO9000/9001-2008/14000 for given manufacturing, service sector.	V	K3	1,2,3,5,11,12	1,2, 3

#### CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C409E6.1	3	2	1	-	-	-	-	-	-	-	2	-	3	2	1
C409E6.2	3	2	1	-	-	-	-	1	-	-	2	-	3	2	1
C409E6.3	3	2	1	1	2	-	-	-	-	-	2	1	3	2	1
C409E6.4	3	2	1	2	2	-	1	-	-	-	2	-	3	2	1
C409E6.5	3	2	1	-	-	-	-	-	-	-	2	1	2	2	1
C409E6.6	3	2	1	-	1	-	-	-	-	-	2	1	2	2	1
C409E6	3	2	1	-	1	-	-	-	-	-	2	1	2	2	1