CO-PO &CO-PSOs Mapping for R16 Regulation

1st Semester

Course Name: English-1(C111)

C111.1	Develop knowledge in different fields and serve the society and interpret a figure/graph/chart/table with special focus on tenses
C111.2	Stimulate the public to adopt road safety measure and emphases on idioms
C111.3	Give Examples that mass production is ultimately detrimental to biological survival understand the use of cohesive devices
C111.4	Choose a source of energy suitable for rural India and acquire writing skills
C111.5	Explain the usefulness of animals for the human society and develop extensive reading skill and comprehension
C111.6	Identify safety measures against different varieties of accidents at home and in the workplace and writes paragraphs

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C111.1	-	-	1	-	-	-	2	2	2	3	-	1
C111.2	-	-	1	-	-	-	2	2	2	3	-	1
C111.3	-	-	1	-	-	-	2	2	2	3	-	1
C111.4	-	-	1	-	-	-	2	2	2	3	-	1
C111.5	-	-	1	-	-	-	2	2	2	3	-	1
C111.6	-	-	1	-	-	-	2	2	2	3	-	1
C111	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**2**	**2**	**3**	**-**	**1**

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C111.1	-	-	-
C111.2	-	-	-
C111.3	-	-	-
C111.4	-	-	-
C111.5	-	-	-
C111.6	-	-	-
C111	**-**	**-**	**-**

Course Name: Mathematics - I (C112)

Subject Name: **Mathematics –I**	Subject Code: **R161102**
C112.1	Solve Differential Equations of first order and first degree and apply to Physical and Geometrical problems
C112.2	Solve Higher order ODE and apply to circuits and SHM.
C112.3	Determine Laplace Transform and inverse Laplace Transform of various functions and use Laplace Transforms to determine general solution to linear ODE
C112.4	Calculate total derivative, JaCbin, maxima and minima of functions of two variables.
C112.5	Form and solve First order PDE.
C112.6	Solving Higher order PDE.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C112.1	3	3	2	2	1	-	-	-	-	-	-	1
C112.2	3	3	2	2	1	-	-	-	-	-	-	1
C112.3	3	3	2	2	1	-	-	-	-	-	-	1
C112.4	3	3	2	2	1	-	-	-	-	-	-	1
C112.5	3	3	2	2	1	-	-	-	-	-	-	1
C112.6	3	3	2	2	1	-	-	-	-	-	-	1
C112	3	3	2	2	1	-	-	-	-	-	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C112.1	3	2	-
C112.2	3	2	-
C112.3	3	2	-
C112.4	3	2	-
C112.5	3	2	-
C112.6	3	2	-
C112	**3**	**2**	-

Course Name: Applied Chemistry (113)

Subject Name: **Applied Chemistry**	Subject Code: **R161106**
C113.1	The advantages and limitations of plastic materials and their use in design would be understood.
C113.2	Fuels which are used commonly and their economics, advantages and limitations are discussed.
C113.3	Reasons for corrosion and some methods of corrosion control would be understood.
C113.4	The students would be now aware of materials like Nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained.
C113.5	Conductance phenomenon is better understood.
C113.6	The students are exposed to some of the alternative fuels and their advantages and limitations.

MAPPING OF COs WITH POs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
C113.1	2	1	1	-	1	2	1	1	-	-	-	-
C113.2	1	1	1	-		1	1	1	-	-	-	-
C113.3	2	1	-	1	1	-	-	-	1	-	1	-
C113.4	1	1	2	1	1	1	1	1	-	-	-	2
C113.5	1	-	1	-	1	-	1	-	-	-	-	-
C113.6	1	2	2	-	2	2	1	1	1	-	2	1
C113	1.3	1.2	1.4	1	1.2	1.5	1	1	1	--	1.5	1.5

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C113.1	3	1	-
C113.2	1	-	-
C113.3	3	-	1
C113.4	1	1	1
C113.5	3	-	1
C113.6	2	-	1
C113	2.16	1	1

Course Name: Computer Programming (114)

Subject Name: **Computer Programming**	Subject Code: **R161107**
C114.1	Understand the basic terminology used in computer programming
C114.2	Write, compile and debug programs in C language.
C114.3	Use different data types in a computer program and design programs involving decision structures, loops and functions.
C114.4	Explain the difference between call by value and call by reference
C114.5	Understand the dynamics of memory by the use of pointers and use different data structures and create/update basic data files.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C114.1	-	3	-	-	2	-	-	-	-	-	-	-
C114.2	-	-	-	-	3	-	-	-	-	-	-	-
C114.3	2	3	3	-	-	-	-	-	-	-	-	-
C114.4	-	-	3	-	2	-	-	-	-	-	-	-
C114.5	-	-	3	3	2	-	-	-	-	-	-	-
C114	2	3	3	3	2.25	-	-	-	-	-	-	-

MAPPING OF COs WITH PSOs

	PSO 1	**PSO 2**	**PSO3**
C114.1	3	2	2
C114.2	3	2	3
C114.3	3	2	2
C114.4	3	2	2
C114.5	3	2	3
C114.6	3	2	2.28
C114	**3**	**2**	2

Course Name: Engineering Mechanics (115)

Subject Name: **Engineering Mechanics**	Subject Code: **R161111**
C115.1	Understand the concepts of force and friction, direction and its application.
C115.2	Know the application of free body diagrams and make solution to problems using graphical methods and law of triangle of forces
C115.3	Calculate the centroid and center of gravity
C115.4	Exposed to concepts of moment of inertia and polar moment of inertia including transfer methods and their applications
C115.5	Exposed to motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion
C115.6	Exposed to concepts of work, energy and particle motion

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C115.1	3	2	1	2	----	1	----	----	----	----	----	----
C115.2	2	2	2	2	----	----	----	----	----	----	----	----
C115.3	2	1	2	1	----	----	----	----	----	----	----	----
C115.4	2	1	1	1	----	1	----	----	----	----	----	----
C115.5	3	2	2	1	----	1	----	----	----	----	----	----
C115.6	3	2	2	2	----	1	----	----	----	----	----	----
C115	2.5	1.6	1.6	1.5	----	1	----	----	----	----	----	----

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C115.1	----	1	----
C115.2	----	1	----
C115.3	----	1	----
C115.4	----	2	----
C115.5	----	2	----
C115.6	----	1	----
C115	--	1.33	---

Course Name: Environmental Studies (116)

Subject Name: **Environmental Studies**	Subject Code: **R161108**
C116.1	The Global Climate change and concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
C116.2	The student should have knowledge on the natural resources and their importance. The biodiversity of india and the threats to biodiversity and conservation
C116.3	Various attributes of the pollution and their impacts and measures to reduce or control the pollution
C116.4	The environmental legislation of India and the first global initiatives towards sustainable development,
C116.5	The first global initiatives about environmental assessment and the stages involved in EIA and the Environmental Audit

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C116.1	1	1		1	2	1	2	1			1	1
C116.2	2	2		1			1		1		2	1
C116.3	1	1	2	1	1		3	1	2	1		2
C116.4	2	1				3		1		1	2	2
C116.5				1				1		1		
C116	1.5	1.25	2	1	1.5	2	2	1	1.5	1	1.66	1.5

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C116.1	-	1	-
C116.2	-	1	-
C116.3	-	-	-
C116.4	1	1	-
C116.5	-	2	-
C116.6	1	1	-
C116	**1**	**1.2**	-

Course Name: Applied Chemistry Lab (C117)

Subject Name: **Applied Chemistry Lab**	Subject Code: **R161122**
C117.1	Ability to find the Fe+2, Ca, Mg, Cu and Cl- present in unknown samples/ores using titrimetric and instrumental methods.
C117.2	The students will get the ability to identify any unknown chemical and its nature according to its functionality.
C117.3	Differentiate between hard and soft water. Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.
C117.4	Understand the principles of Stoichiometric, Potentiometric and Conduct metric measurements.
C117.5	Understand the practical way of thinking through the prescribed experiments given to them.
C117.6	They get the knowledge about p^H which influences human health, growth of plants and aquatic bio-components.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C117.1	3	1	2	1	2	2	-	-	-	-	-	-
C117.2	3	2	3	-	2	2	-	-	-	-	-	-
C117.3	3	3	3	-	2	2	-	1	-	1	1	1
C117.4	3	-	1	-	2	2	-	-	-	-	-	-
C117.5	3	1	3	-	2	2	-	1	-	1	1	1
C117.6	3	2	3	2	2	2	-	1	-	1	1	1
C117	3	1.8	2.5	1.5	2	2	-	1	-	1	1	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C117.1	2	1	-
C117.2	3	-	-
C117.3	3	1	1
C117.4	2	1	-
C117.5	2	-	1
C117.6	1	-	3
C117	2.16	1	1.66

Course Name: Computer Programming Lab (118)

Subject Name: **Computer Programming Lab**	Subject Code: **R161119**
C118.1	Apply and practice logical ability to solve the problems.
C118.2	Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment
C118.3	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
C118.4	Understand and apply the in-built functions and customized functions for solving the problems and Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
C118.5	Document and present the algorithms, flowcharts and programs in form of user-manuals and Identification of various computer components, Installation of software

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C118.1	2	1	2	1	3	-	-	-	-	-	-	-
C118.2	-	-	2	-	3	-	-	-	-	-	-	-
C118.3	-	2	-	2	1	-	-	-	-	-	-	-
C118.4	1	2	2	2	-	-	-	-	-	-	-	-
C118.5	1	2	2	-	3	-	-	-	-	-	-	-
C118	1.3	2.3	2	1.6	2.5	-	-	-	-	-	-	-

MAPPING OF COs WITH PSOs

	PO1	**PO2**	**PSO3**
C118.1	-	-	2
C118.2	2	-	3
C118.3	-	-	2
C118.4	-	-	2
C118.5	-	2	3
C118	2	2	2.4

Course Name: Computer Programming Lab (C119)

Subject Name: **English Communication Skills Lab -I**	Subject Code: **R161114**
C119.1	Practice English languages, both written and spoken, competently and correctly
C119.2	Develop accuracy and fluency of speech
C119.3	Employ confidence in using English in verbal situations
C119.4	Understand Letters and Sounds of English
C119.5	Articulate the Sounds of English
C119.6	Focus on Stress and Intonation of native speakers of English

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C119.1	-	-	1	-	-	-	2	2	2	3	-	1
C119.2	-	-	1	-	-	-	2	2	2	3	-	1
C119.3	-	-	1	-	-	-	2	2	2	3	-	1
C119.4	-	-	1	-	-	-	2	2	2	3	-	1
C119.5	-	-	1	-	-	-	2	2	2	3	-	1
C119.6	-	-	1	-	-	-	2	2	2	3	-	1
C119	-	-	1	-	-	-	2	2	2	3	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C119.1	-	-	-
C119.2	-	-	-
C119.3	-	-	-
C119.4	-	-	-
C119.5	-	-	-
C119.6	-	-	-
C119	-	-	-

2nd Semester

Course Name: English – II (C121)

Subject Name: **English-II**	Subject Code: **R161201**
C121.1	Discuss the ultimate aim of Education is to enhance wisdom, Abdul Kalam's simple life and service to the nation inspires the readers to follow in his footsteps and acquire official letter writing
C121.2	Stimulate the students to promote peaceful co-existence and universal harmony, highlights the dedicated research work of C V Raman and acquire e-correspondence writing
C121.3	Explain the students to manage different cultural shocks due to globalization, provides an aspiration to the readers from Bhabha to serve the nation and strengthen it and acquire speech writing
C121.4	Analyze insightful commentary on cultural traditions and Bose provide inspiration to the readers and acquire essay writing
C121.5	Distinguish several inputs to protect environment for the sustainability of the future generations, Ray's scientific achievements and acquire writing for the media
C121.6	Focus on the extraordinary achievements of Srinivasa Ramanujan, and acquire report writing

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C121.1	-	-	1	-	-	-	2	2	2	3	-	1
C121.2	-	-	1	-	-	-	2	2	2	3	-	1
C121.3	-	-	1	-	-	-	2	2	2	3	-	1
C121.4	-	-	1	-	-	-	2	2	2	3	-	1
C121.5	-	-	1	-	-	-	2	2	2	3	-	1
C121.6	-	-	1	-	-	-	2	2	2	3	-	1
C121	-	-	1	-	-	-	2	2	2	3	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C121.1	-	-	-
C121.2	-	-	-
C121.3	-	-	-
C121.4	-	-	-
C121.5	-	-	-
C121.6	-	-	-
C121	-	-	-

Course Name: Mathematics – II (Mathematical Methods) (C122)

Subject Name: Mathematics –II		Subject Code: R161202
C122.1	Obtain Numerical solution of Transcendental Equations	
C122.2	Estimate value of dependent variable for a given set of observations	
C122.3	Finding Numerical solutions of IVP	
C122.4	Fourier series expansion of periodic functions, Half Range Fourier series	
C122.5	Solution of Higher order PDE by separation of variable and applications	
C122.6	Fourier Sine and Cosine integral and Fourier transforms and finite Fourier transforms	

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C122.1	3	3	2	2	1	-	-	-	-	-	-	1
C122.2	3	3	2	2	1	-	-	-	-	-	-	1
C122.3	3	3	2	2	1	-	-	-	-	-	-	1
C122.4	3	3	2	2	1	-	-	-	-	-	-	1
C122.5	3	3	2	2	1	-	-	-	-	-	-	1
C122	3	3	2	2	1	-	-	-	-	-	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C122.1	1	2	-
C122.2	1	2	-
C122.3	1	2	-
C122.4	1	2	-
C122.5	1	2	-
C122	1	2	-

Course Name: Mathematics – III (C123)

Subject Name: **Mathematics –III**	Subject Code: **R161203**
C123.1	Determine Rank and solve system of simultaneous linear equations using matrix methods.
C123.2	Determine Eigen vectors of a Matrix and finding nature of a Quadratic form.
C123.3	Determine double integral over a region and triple integral over a volume.
C123.4	Determine double integral over a region and triple integral over a volume.
C123.5	Calculate gradient of a scalar function, divergence and curl of a vector function
C123.6	Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C123.1	3	3	2	2	1	-	-	-	-	-	-	1
C123.2	3	3	2	2	1	-	-	-	-	-	-	1
C123.3	3	3	2	2	1	-	-	-	-	-	-	1
C123.4	3	3	2	2	1	-	-	-	-	-	-	1
C123.5	3	3	2	2	1	-	-	-	-	-	-	1
C123.6	3	3	3	3	1	-	-	-	-	-	-	1
C123	3	3	3	3	1	-	-	-	-	-	-	1

MAPPING OF COs WITH PSOs

	PSO1	PSO2	PSO3
C123.1	1	2	-
C123.2	1	2	-
C123.3	1	2	-
C123.4	1	2	-
C123.5	1	2	-
C123.6	1	2	-
C123	1	2	-

Course Name: **ENGINEERING WORKSHOP AND IT WORKSHOP LAB (C124)**

Subject Name: **ENGINEERING WORKSHOP AND IT WORKSHOP LAB**	Subject Code: **R161224**
C124.1	To Acquire the knowledge of safety measures which are followed in workshop while using hand tools and general purpose machine tools.
C124.2	To impart hands-on practice on basic engineering trades.
C124.3	To get Knowledge on tolerances and fits and Usage of measuring tools
C124.4	Apply knowledge for CO124.mputer assembling and software installation.
C124.5	Ability how to solve the trouble shooting problems.
C124.6	Apply the tools for preparation of PPT, Documentation and budget sheet.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C124.1	1	-	1	-	1	2	2	-	-	-	-	-
C124.2	-	1	1	-	1	-	-	-	-	-	-	-
C124.3	2	1	1	-	-	1	-	-	-	-	-	-
C124.4	3	1	-	1	2	-	-	-	-	-	-	2
C124.5	3	2	2	2	2	-	-	-	-	-	-	2
C124.6	3	2	-	-	-	-	-	-	-	2	2	2
C124	2.16	1.4	1.33	1.5	1.5	1.5	2	-	-	2	2	2

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C124.1	2	1	1
C124.2	2	2	1
C124.3	1	-	1
C124.4	3	2	2
C124.5	1	-	-
C124.6	-	3	-
C124	1.8	2	1.25

Course Name: **Applied/Engineering Physics Laboratory (C125)**

Subject Name: **Applied/Engineering Physics Laboratory**		Subject Code: **R161225**
C125.1	Analyze and apply the concepts of oscillations and of wave(sonometer, meldes experiment)	
C125.2	To interpret the intensity variation of light due to Polarization, interference and diffraction	
C125.3	Compare the intensity of magnetic field theoretically and experimentally.	
C125.4	To study simple harmonic motion and the factors that affect the period of oscillation of pendulums	
C125.5	Explain how frequency effects the impedence and to calculate resonant frequency	
C125.6	To Interpret various applications of zener diode.	

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C125.1	3	1	2	1	2	2	-	-	-	-	-	-
C125.2	3	2	3	-	2	2	-	-	-	-	-	-
C125.3	3	3	3	-	2	2	-	1	-	1	1	1
C125.4	3		1	-	2	2	-	-	-	-	-	-
C125.5	3	1	3	-	2	2	-	1	-	1	1	1
C125.6	3	2	3	2	2	2	-	1	-	1	1	1
C125	3	1.8	2.5	1.5	2	2	-	1	-	1	1	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C125.1	1	-	-
C125.2	1	-	-
C125.3	3	2	-
C125.4	1	-	-
C125.5	3	1	-
C125.6	3	3	-
C125	2	2	-

Course Name: ENGINEERING DRAWING (C126)

Subject Name: **ENGINEERING DRAWING**	Subject Code: **R161206**
C126.1	Construct polygons, Engineering Curves.
C126.2	Understand scales and orthographic projections, projections of points & lines.
C126.3	Draw the projections of the lines inclined to both the planes.
C126.4	Draw the projections of the plane inclined to both the planes.
C126.5	Draw the projections of the various types of solids in different positions inclined to one or both the planes.
C126.6	Visualize and convert the isometric view to orthographic view and vice versa.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C126.1	1	1	2	2	-	-	-	-	2	2	-	-
C126.2	1	1	2	2	-	-	-	-	2	2	-	-
C126.3	1	1	2	2	-	-	-	-	2	2	-	-
C126.4	1	1	2	2	-	-	-	-	2	2	-	-
C126.5	1	1	2	2	-	-	-	-	2	2	-	-
C126.6	1	1	2	2	-	-	-	-	2	2	-	-
C126	1	1	2	2	-	-	-	-	2	2	-	-

MAPPING OF COs WITH PSOs

	PSO 1	**PSO 2**	**PSO3**
C126.1	-	-	-
C126.2	-	-	-
C126.3	-	-	-
C126.4	-	-	-
C126.5	-	-	-
C126.6	-	-	-
C126	-	-	-

Course Name: Applied Physics (C127)

Subject Name: **Applied Physics**	Subject Code: **R161207**
C127.1	The properties of light supporting the wave nature and constructive working principle of Interferometers.
C127.2	The bending nature of the light from different slits and resolving powers of Grating, Telescope and Microscope.
C127.3	The transverse nature of the light from methods of production and analysis and learn the working principle of Polarimeter and Lasers
C127.4	The EM Fields, relation between the line, surface and volume integrals and propagation of em waves through dielectric medium**.**
C127.5	The concepts of Quantum nature of matter, Schrodinger wave equations with it's applications and mechanism of electron transportation in metals
C127.6	The energy band gap concepts and classification of solids on the basis of it. Understand the Physics Of Semiconductors And Their Working Mechanism For Their Utility In Electronic devices.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C127.1	3	-	-	1	-	1	-	-	-	-	1	1
C127.2	3	-	-	3	-	-	-	-	-	-	2	1
C127.3	3	2	3	3	1	3	3	1	2	3	3	3
C127.4	3	2	-	-	-	-	-	1	-	-	2	2
C127.5	3	-	1	2	-	-	-	-	1	-	-	1
C127.6	3	3	2	1	2	3	3	1	2	3	3	3
C127	3	2.2	2	2	1.5	2.3	3	1	1.7	3	2.2	1.8

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C127.1	1	-	1
C127.2	1	-	1
C127.3	3	2	2
C127.4	3	3	2
C127.5	1	-	-
C127.6	3	2	3
C127	2	2.3	1.8

Course Name: Electrical Circuit Analysis – I (C128)

Subject Name: **Electrical Circuit Analysis – I**	Subject Code: **R161208**
C128.1	Understanding the concepts of passive elements, types of sources and various network reduction techniques.
C128.2	Understand the concept of magnetic coupled circuit.
C128.3	Understanding the behavior of RLC networks for sinusoidal excitations
C128.4	Understanding the applications of network theorems for analysis of electrical networks
C128.5	Understanding the applications of Electrical circuits in machines.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C128.1	2	1	2	2	2	----	----	----	----	----	----	----
C128.2	2	2	2	2	1	----	----	----	----	----	----	----
C128.3	1	1	3	2	1	----	----	----	----	----	----	----
C128.4	1	----	2	2	----	1	----	----	1	----	----	----
C128.5	1	1	1	2	1	1	----	-----	----	----	-----	-----
C128.6	1.4	1	2	2	1	1	----	----	1	----	----	----
C128	2	1	2	2	2	----	----	----	----	----	----	----

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C128.1	3	3	2
C128.2	2	2	2
C128.3	1	1	2
C128.4	1	3	1
C128.5	2	2	2
C128.6	1.8	2.2	1.8
C128	3	3	2

Course Name: English Communication Skills Lab -II (C129)

Subject Name: **English Communication Skills Lab -II**	Subject Code: **R161221**
C129.1	Develop fluency of speech by participating in debates
C129.2	Employ communicative language and participate in Group Discussions
C129.3	Give examples to avoid stage fear and make presentations with ease and confidence
C129.4	Employ confidence in attending different types of interviews
C129.5	Understand the importance of e mail writing skills and its techniques
C129.6	Produce right words and phrases in keeping the demands of occasion

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C129.1	-	-	1	-	-	-	2	2	2	3	-	1
C129.2	-	-	1	-	-	-	2	2	2	3	-	1
C129.3	-	-	1	-	-	-	2	2	2	3	-	1
C129.4	-	-	1	-	-	-	2	2	2	3	-	1
C129.5	-	-	1	-	-	-	2	2	2	3	-	1
C129.6	-	-	1	-	-	-	2	2	2	3	-	1
C129	-	-	1	-	-	-	2	2	2	3	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C129.1	-	-	-
C129.2	-	-	-
C129.3	-	-	-
C129.4	-	-	-
C129.5	-	-	-
C129.6	-	-	-
C129	-	-	-

3rd Semester

Course Name: Electrical Circuit Analysis – II (C211)

Subject Name: **Electrical Circuit Analysis – II**	Subject Code: **R1621021**
C211.1	Students are able to solve three-phase circuits under balanced and unbalanced conditions.
C211.2	Students are able to find out transient response of electrical networks with different types of excitations.
C211.3	Students are able to estimate the different types of two port network parameters.
C211.4	Students are able to design Electrical networks by using network synthesis
C211.5	Students are able to analyze the electrical circuits using Fourier series and Fourier transforms

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
211.1	2	3	3	3	3	-	-	-	2	1	1	3
211.2	2	3	3	3	3	-	-	-	2	1	1	3
211.3	3	3	3	3	3	-	-	-	2	1	1	3
211.4	3	3	3	3	3	-	-	-	2	1	1	3
211.5	3	3	3	3	3	-	-	-	2	1	1	3
211.6	2.6	3	3	3	3	-	----	----	2	1	1	3
211	2	3	3	3	3	-	-	-	2	1	1	3

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C211.1	3	2	1
C211.2	2	3	3
C211.3	3	1	2
C211.4	3	1	2
C211.5	3	1	2
C211.6	2.8	1.6	2
C211	3	2	1

Course Name: Electrical Machines-I (C212)

Subject Name: **Electrical Machines-I**	Subject Code: **R1621022**
C212.1	Understand the unifying principles of electromagnetic energy conversion. And the construction, principle of operation and performance of DC machines.
C212.2	To learn the characteristics, performance, methods of speed control and testing methods of DC motors.
C212.3	To predetermine the performance of single phase transformers with equivalent circuit models.
C212.4	Understand the methods of testing of single-phase transformer
C212.5	Analyze the three phase transformers and achieve three phase to two phase Conversion.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C212.1	2	2	2	2	2	1	----	----	----	----	----	1
C212.2	1	1	2	2	1	1	----	----	----	----	----	1
C212.3	1	1	1	1	2	1	----	----	----	----	----	1
C212.4	1	1	1	2	2	1	----	----	-----	----	----	1
C212.5	2	2	2	2	2	1	-----	-----	-----	-----	-----	1
C212	1.4	1.4	1.6	1.8	1.8	1.25	----	----	----	----	----	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C212.1	1	1	2
C212.2	2	2	3
C212.3	1	1	2
C212.4	2	2	3
C212.5	2	2	3
C212.6	2	1.6	2.6
C212	1	1	2

Course Name: Basic Electronics and Devices (C213)

Subject Name: **Basic Electronics and Devices**	Subject Code: **R1621023**
C213.1	Students will able to understand the basic concepts of semiconductors.
C213.2	Students will able to understand the principle and operation of various diodes along with its applications.
C213.3	Students will able to understand the basic operation of half wave and full wave diode rectifiers.
C213.4	Students will able to understand the characteristics of various transistor configurations along with its stabilization and compensation circuits.
C213.5	Students will able understand the basic concepts of FET devices, feedback amplifiers and oscillators.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C213.1	3	3	-	-	-	-	-	-	-	-	-	2
C213.2	3	2	-	-	-	-	-	-	-	-	-	2
C213.3	3	3	2	-	-	-	-	-	-	-	-	-
C213.4	3	3	3	-	-	-	-	-	-	-	-	-
C213.5	3	3	3	-	-	-	-	-	-	-	-	2
C213.	3	2.8	1.6	-	-	-	-	-	-	-	-	1.2

MAPPING OF COs WITH PSOs

	PSO 1	**PSO 2**	**PSO3**
C213.1	2	1	-
C213.2	2	1	-
C213.3	2	1	-
C213.4	2	1	-
C213.5	2	1	-
C213	2	1	0

Course Name: Electro Magnetic Fields **(C214)**

Subject Name: **Electro Magnetic Fields**	Subject Code: **R1621024**
C214.1	To Determine electric fields and potentials using guass's law or solving Laplace's or Possion's equations, for various electric charge distributions.
C214.2	To find the behaviour of conductors and insulators in electric field & also Calculate and design capacitance, energy stored in dielectrics
C214.3	To Calculate the magnetic field intensity due to current, the application of ampere's law and the Maxwell's second and third equations.
C214.4	To determine the magnetic forces and torque produced by currents in magnetic field, self and mutual inductances and the energy stored in the magnetic field
C214.5	To calculate induced e.m.f., understand the concepts of displacement current and Poynting vector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C214.1	3	1	2	1	----	1	1	----	----	----	----	----
C214.2	3	1	2	1	----	----	----	----	----	----	----	----
C214.3	2	2	1	----	----	1	1	----	----	----	----	----
C214.4	3	2	1	----	----	1	1	----	----	----	----	----
C214.5	2	1	1	2	----	----	----	----	----	----	----	1
C214	2.6	1.4	1.4	0.8	0	0.6	0.6	----	----	----	----	0.2

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C214.1	2	1	----
C214.2	2	1	----
C214.3	2	1	___
C214.4	2	2	----
C214.5	3	2	---
C214	2	1.4	0

Course Name: Thermal and Hydro Prime movers **(C215)**

Subject Name: **Thermal and Hydro Prime movers**	Subject Code: **R1621025**
C215.1	Students learn about constructional features, operational details of various type of internal combustion engines through the details of several engine systems and the basic air standard cycles, which govern the engines and able to calculate the performance of different types of internal combustion engines.
C215.2	Students are able to understand the working principle and evaluate the performance characteristics of steam and gas turbines.
C215.3	Students are able to understand the fundamental of fluid dynamic equations and its applications fluid jets and to impart the knowledge of various types of pumps, their constructional features, working and performance.
C215.4	Students are able to understand the working principle of hydro power plant and Calculate the performance of hydraulic turbines.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C215.1	2	2	-	1	-	-	-	-	-	-	1	1
C215.2	2	2	-	1	-	-	-	-	-	-	1	1
C215.3	2	2	-	1	-	-	-	-	-	-	1	1
C215.4	2	2	2	1	-	2	-	-	-	-	1	1
C215	2	2	2	1	-	2	-	-	-	-	1	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C215.1			
C215.2			
C215.3			
C215.4			
C215			

Course Name: **Managerial Economics and Financial Analysis (C216)**

Subject Name: **Managerial Economics and Financial Analysis**	Subject Code: **R1621026**
C216.1	Gain knowledge in basic economic tools in managerial economics and demand analysis.
C216.2	Understand and estimate the demand elasticity and its relationship to pricing and revenue and markets.
C216.3	Analyze the production, cost concepts and organization forms.
C216.4	To understand the maintenance of books of accounts and financial statement analysis
C216.5	Understand the expenditure and capital budgeting in big industries.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C216.1	2	----	----	3	2	----	----	----	----	----	----	----
C216.2	----	----	3	3	1	----	----	----	----	----	----	----
C216.3	----	3	----	----	2	----	----	----		----	----	----
C216.4	----	3	----	----	2	----	----	----	2	----	----	----
C216.5	----	----	2	----	----	----	----	----	----	----	----	----
C216	2	3	2.5	3	1.75	1	----	---	2	----	----	--

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C216.1	----	2	2
C216.2	2	----	----
C216.3	1	1	----
C216.4	1	1	----
C216.5	---	---	----
C216	1.33	1.33	2

Course Name: Thermal and Hydro Prime movers' lab (C217)

Subject Name: **Thermal and Hydro Prime movers lab**	Subject Code: **R1621027**
C217.1	Students will be able to explain the working principle of different types of IC engines and illustrate the valve timing and port diagrams of an IC engines.
C217.2	Students will be able to Perform the load, Morse, Heat balance and economical speed test on IC engines.
C217.3	Students will be able to discuss the working principle of different types of hydraulic turbines & conduct performance tests.
C217.4	Students will be able to illustrate the working principle of centrifugal and reciprocating pumps & conduct performance tests.
C217.5	Students will be able to calibrate Venturimeter & Orifice meter.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C217.1	1	-	-	2	-	-	-	-	-	-	-	-
C217.2	2	2	-	2	-	-	-	-	-	-	-	1
C217.3	2	2	-	2	-	-	-	-	-	-	-	1
C217.4	2	2	-	2	-	-	-	-	-	-	-	1
C217.5	2	2	-		-	-	-	-	-	-	-	1
C217	1.8	2	-	2	-	-	-	-	-	-	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C217.1	-	-	-
C217.2	-	1	1
C217.3	-	1	1
C217.4	-	1	1
C217.5	-	-	-
C217	-	1	1

Course Name: Electrical Circuits Lab (C218)

Subject Name: **Electrical Circuits Lab**	Subject Code: **R1621028**
C218.1	Students can able to apply various network theorems on given electric circuits
C218.2	Students can able to determine the maximum and minimum currents in the circuit under resonance condition.
C218.3	Students can able to determine self and mutual inductance of a transformer
C218.4	Students can able to determine two port parameters of a given electrical circuits.
C218.5	Students can able to draw the waveforms and phasor diagram for lagging and leading networks.

MAPPING OF COs WITH POs

	PO	PO	PO3	PO4	PO	PO6	PO7	PO8	PO9	PO	PO11	PO12
C218.	3	3	3	3	3	-	-	-	2	1	2	3
C218.	3	3	3	3	3	-	-	-	2	1	2	3
C218.	3	3	3	3	3	-	-	-	2	1	2	3
C218.	3	3	3	3	3	-	-	-	2	1	2	3
C218.	3	3	3	3	3	-	-	-	2	1	2	3
C218.	3	3	3	3	3	-	----	----	2	1	2	3
C218	3	3	3	3	3	-	-	-	2	1	2	3

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C218.1	3	3	3
C218.2	3	3	3
C218.3	3	3	3
C218.4	3	3	3
C218.5	3	3	3
C218.6	3	3	3
Avg.	3	3	3

4th Semester

Course Name: Electrical Measurements **(C221)**

Subject Name: **Electrical Measurements**	Subject Code: **R1622021**
C221.1	Able to choose right type of instrument for measurement of voltage and current for ac and dc.
C221.2	Able to choose right type of instrument for measurement of power and energy – able to calibrate energy meter by suitable method
C221.3	Able to calibrate ammeter and potentiometer and to use the ballistic galvanometer and flux meter for magnetic measuring instruments
C221.4	Able to select suitable bridge for measurement of electrical parameters
C221.5	Able to measure frequency and phase difference between signals using CRO. Able to use digital instruments in electrical measurements

MAPPING OF COs WITH POs

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
C221.1	3	1	2	1	2	1	-----	----	----	----	----	----
C221.2	3	2	1	----	----	1	1	----	----	----	----	----
C221.3	3	2	1	----	----	1	1	----	----	----	----	----
C221.4	2	1	1	2	----	----	----	----	----	----	----	-----
C221.5	3	2	1	---	---	1	1	-----	----	-----	----	-----
C221.6	2.8	1.6	1.2	0.6	0.4	0.8	0.6	----	----	----	----	-----
C221	3	1	2	1	2	1	-----	----	----	----	----	----

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C221.1	2	---	1
C221.2	2	---	1
C221.3	1	----	1
C221.4	2	-----	1
C221.5	2	2	1
C221.6	1.8	2	1

Course Name: Electrical Machines-II (C222)

Subject Name: **Electrical Machines-II**	Subject Code: **R1622022**
C222.1	Understand the principle of operation and performance of 3-phase induction motor and Induction generator
C222.2	To understand the torque producing mechanism of a single phase induction motor
C222.3	To understand the principle of emf generation, the effect of armature reaction and predetermination of voltage regulation in synchronous generators
C222.4	To study parallel operation and control of real and reactive powers for synchronous generators
C222.5	To understand the operation, performance and starting methods of synchronous motor

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C222.1	2	1	2	2	1	----	----	----	----	----	----	1
C222.2	1	2	2	2	1	----	----	----	----	----	----	1
C222.3	1	1	1	1	1	----	----	----	----	----	----	1
C222.4	1	2	1	2	1	-----	----	----	-----	----	----	1
C222.5	2	1	2	1	1	-----	-----	-----	-----	-----	-----	1
C222.6	1.4	1.4	1.6	1.6	1	----	----	----	----	----	----	1
C222	2	1	2	2	1	----	----	----	----	----	----	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C222.1	2	2	1
C222.2	3	1	2
C222.3	2	2	2
C222.4	1	2	1
C222.5	2	1	1
C222	2	1.6	1.4

Course Name: Switching Theory and Logic Design (C223)

Subject Name: **Switching Theory and Logic Design**	Subject Code: **R1622023**
C223.1	**Understand** number systems, binary addition and subtraction, 2's complement representation and operations with this representation and understand the different binary codes.
C223.2	**Explain** switching algebra theorems and apply them for logic functions
C223.3	**Identify** the importance of SOP and POS canonical forms in the minimization or other optimization of Boolean formulas in general and digital circuits. .
C223.4	**Discuss** about digital logic gates and their properties.
C223.5	**Evaluate** functions using various types of minimizing algorithms like Boolean algebra, Karnaugh map or tabulation method.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C223.1	3	3	-	1	-	-	-	-	-	-	-	-
C223.2	3	3	-	1	-	-	-	-	-	-	-	-
C223.3	3	3	3	2	2	-	-	-	-	2	-	2
C223.4	3	3	3	3	3	-	-	-	-	2	-	2
C223.5	3	3	2	1	2	-	-	-	-	-	-	1
C223	3	3	1.6	1.6	1.4	-	-	-	-	0.8	-	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C223.1	3	-	3
C223.2	3	-	3
C223.3	3	2	3
C223.4	3	2	3
C223.5	3	-	3
C223	3	0.8	3

Course Name: Control Systems **(C224)**

Subject Name: **Control Systems**	Subject Code: **R1622024**
C224.1	Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs.
C224.2	Analyze the dynamics of control systems in time domain and Absolute stability of systems using R-H criteria and Root locus.
C224.3	Understand concept of stability of control systems, Relative stability of LTI systems using Bode plot, polar plot and Nyquist Plot
C224.4	Design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams
C224.5	Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C224.1	3	1	1	--	--	--	--	--	--	--	--	--
C224.2	3	2	1	1	1	--	--	--	--	--	--	--
C224.3	3	3	2	1	1	--	--	--	--	--	--	--
C224.4	2	2	2	1	2	--	--	--	--	--	--	--
C224.5	2	2	2	2	2	--	--	--	--	--	--	--
C224	2.6	2	1.6	1.25	1.5	--	--	--	--	--	--	--

MAPPING OF COs WITH PSOs

	PSO1	PSO2	PSO3
C224.1	1	3	1
C224.2	2	2	3
C224.3	1	1	2
C224.4	1	2	2
C224.5	1	2	1
C224	1.2	2	1.8

Course Name: Power Systems – I **(C225)**

Subject Name: **Power Systems – I**	Subject Code: **R1622025**
C225.1	Students are able to identify the different components of thermal power plants & nuclear Power plants.
C225.2	Students are able to distinguish between AC/DC distribution systems and also estimate voltage drops of distribution systems.
C225.3	Students are able to identifythe different components of air and gas insulated substations.
C225.4	Students are able to identifysingle core and multi core cables with different insulating materials.
C225.5	Students are able to analyze the different economic factors of power generation and tariffs.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO
C225.1	2	3	3	3	3	2	-	-	2	1	1	3
C225.2	2	3	3	3	3	2	-	-	2	1	1	3
C225.3	3	3	3	3	3	-	-	-	2	1	1	3
C225.4	3	3	3	3	3	-	-	-	2	1	1	3
C225.5	3	3	3	3	3	-	-	-	2	1	1	3
C225	2.75	3	3	3	3	2	----	----	2	1	1	3

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C225.1	2	3	3
C225.2	2	3	3
C225.3	2	3	3
C225.4	2	3	3
C225.5	3	2	1
C225	2.2	2.8	2.6

Course Name: Management Science (C226)

Subject Name: **Management Science**	Subject Code: **R1622026**
C226.1	Knowledge on Principles of Management, operation management and materials management.
C226.2	Knowledge on various contemporary management practices.
C226.3	Knowledge about professional ethics in various functional departments of the organization.
C226.4	Knowledge on Strategic Management and techniques of business.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C226.1	-	-	-	-	-	-	-	-	3	2	-	-
C226.2	-	-	-	-	-	-	-	-	1	-	2	1
C226.3	-	-	-	-	-	-	-	3	-	-	-	-
C226.4	-	-	-	-	-	-	-	1	-	-	2	1
C226	-	-	-	-	-	-	-	1	1	2	1	0.5

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C226.1	-	1	-
C226.2	-	1	-
C226.3	-	1	-
C226.4	-	1	-
C226	-	1	-

Course Name: Electrical Machines-I Lab **(C227)**

Subject Name: **Electrical Machines-I Lab**	Subject Code: **R1622027**
C227.1	To plot the magnetizing characteristics of DC shunt generator
C227.2	To Understand the mechanism of self-excitation of DC generators
C227.3	To control the speed of the DC motors.
C227.4	Determine and predetermine the performance of DC machines.
C227.5	To predetermine the efficiency and regulation of transformers and assess their performance.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
227.1	2	2	1	1	2	1	--	--	--	--	--	1
227.2	1	2	2	1	2	1	--	--	--	--	--	1
227.3	1	2	2	1	2	1	--	--	--	--	--	1
227.4	2	1	1	1	2	1	--	--	--	--	--	1
227.5	1	2	2	1	2	1	--	--	--	--	--	1
Avg.	1.5	1.75	1.5	1	2	1	---	--	--	--	--	1

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
227.1	2	3	1
227.2	2	3	1
227.3	2	3	1
227.4	2	3	1
227.5	2	3	1
C227	2	3	1

Course Name: Electronic Devices and Circuits Lab (C228)

Subject Name: **Electronic Devices And Circuits Lab**	Subject Code: **R1622028**
C228.1	Understand the diode and transistor characteristics.
C228.2	Verify the rectifier circuits using diodes and implement them using hardware
C228.3	Design various amplifiers like CE, CC and CS amplifiers and implement them using hardware and also observe their frequency responses
C228.4	Remember the concepts of unipolar junction transistor and observe its characteristics. Understand the construction, operation and characteristics of JFET and MOSFET, which can be used in the design of amplifiers.

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C228.1	2	2	3	----	3	----	1	---	1	1	1	1
C228.2	2	2	3	----	3	----	1	---	1	1	1	2
C228.3	2	2	3	----	3	----	1	---	1	1	1	2
C228.4	2	2	3	---	3	----	1	---	1	1	2	1
C228	2	2	3	---	3	----	1	--	1	1	1.25	1.5

MAPPING OF COs WITH PSOs

	PSO1	**PSO2**	**PSO3**
C228.1	2	3	3
C228.2	2	3	3
C228.3	2	3	3
C228.4	2	3	3
C228	2	3	3

5th Semester

Course Name: Power Systems-II (C311)

Subject Name: **Power Systems-II**	Subject Code: **R1631021**
C311.1	Students able to evaluate the inductance/capacitance of transmission lines and understand the concepts of GMD/GMR
C311.2	To study the short and medium length transmission lines, their models and Performance.
C311.3	To study the performance and modeling of long transmission lines and understand the travelling waves on transmission lines
C311.4	To study the factors affecting the performance of transmission lines and power factor improvement methods
C311.5	To discuss sag and tension computation of transmission lines as well as to study the performance of overhead insulators.

Course Name: Power Systems-II **(C311)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C311.1	2	3	3	2	2	----	1	----	----	----	2	2
C311.2	2	3	2	2	2	----	1	----	----	----	1	1
C311.3	2	2	2	2	2	1	1	----	----	----	1	1
C311.4	2	2	2	2	1	1	----	----	-----	----	1	1
C311.5	2	2	2	2	2	2	----	----	-----	----	1	1
C311	2	2.4	2.2	2	1.8	0.8	0.6	--	--	--	1.2	1.2

	PSO1	**PSO2**	**PSO3**
C311.1	2	2	2
C311.2	2	1	2
C311.3	2	1	2
C311.4	1	---	2
C311.5	1	---	2
C311	1.6	0.8	2

Course Name: Renewable Energy Sources (C312)

Subject Name: **Renewable Energy Sources**	Subject Code: **R1631022**
C312.1	To study the solar radiation data, extraterrestrial radiation, radiation on earth's surface
C312.2	To study solar thermal collections and solar photo voltaic systems.
C312.3	To study maximum power point techniques in solar PV and wind energy.
C312.4	To study wind energy conversion systems, Betz coefficient, tip speed ratio.
C312.5	To study basic principle and working of hydro, tidal, biomass, fuel cell and Geothermal systems.

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C312.1	2	2	2	----	2	----	2	----	----	----	----	1
C312.2	3	2	3	3	2	----	3	----	----	----	----	1
C312.3	2	1	----	2	1	----	1	----	----	----	----	----
C312.4	3	2	3	3	2	----	3	----	----	----	----	1
C312.5	2	----	1	----	----	----	2	----	----	----	----	1
C312	2.4	1.75	2.25	2.66	1.75	----	2.2	----	----	----	----	1

CO	**PSO 1**	**PSO 2**	**PSO3**
C312.1	2	2	1
C312.2	3	2	1
C312.3	2	2	2
C312.4	3	2	1
C312.5	2	1	2
C312	2.4	1.8	1.4

Course Name: Signals and Systems **(C313)**

Subject Name: **Signals and Systems**	Subject Code: **R1631023**
C313.1	Characterize the signals and systems and principles of vector spaces, Concept of orthgonality.
C313.2	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
C313.3	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
C313.4	Understand the relationships among the various representations of LTI systems
C313.5	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
C313.6	Apply z-transform to analyze discrete-time signals and systems.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C313.1	3	3	2	1	-	-	-	-	-	-	-	-
C313.2	3	3	1	2	2	1	-	-	-	-	-	-
C313.3	3	1	3	2	1	1	-	-	-	-	-	-
C313.4	2	3	2	2	2	2	-	-	-	-	-	-
C313.5	2	3	1	2	2	1	-	-	-	-	-	-
C313.6	3	2	3	1	1	2	-	-	-	-	-	-
C313	2.67	2.5	2	1.67	1.67	1.17	-	-	-	-	-	-

	PSO 1	**PSO 2**	**PSO3**
C313.1	3	3	3
C313.2	3	2	1
C313.3	2	2	3
C313.4	3	3	2
C313.5	3	2	2
C313.6	3	2	2
C313	2.83	2.33	2.17

Course Name: Pulse and Digital Circuits **(C314)**

Subject Name: **Pulse and Digital Circuits**	Subject Code: **R1631024**
C314.1	Understanding the the concept of wave shaping circuits, Switching Characteristics of diode and transistor.
C314.2	Understand the design and analysis of various Multivibrators
C314.3	Understanding the functioning of different types of time-base Generators
C314.4	Understanding the working of logic families
C314.5	Understanding the Sampling Gates and their applications

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C314.1	1	2	2	1	2	1	----	----	----	----	----	----
C314.2	2	2	2	1	1	1	----	----	1	----	----	----
C314.3	2	2	2	----	----	1	----	----	----	----	----	----
C314.4	2	1	2	1	----	1	----	----	2	----	----	----
C314.5	2	2	2	2	2	1	----	----	----	----	----	----
C314	1.8	1.8	2	1	1	1	----	----	0.75	----	----	----

	PSO1	**PSO2**	**PSO3**
C314.1	2	3	2
C314.2	3	2	2
C314.3	2	1	2
C314.4	2	2	3
C314.5	2	2	2
C314	2.2	2	2.2

Course Name: Power Electronics **(C315)**

Subject Name: **Power Electronics**	Subject Code: **R1631025**
C315.1	Understand the characteristics of various power semiconductor devices and to design firing circuits for SCR.
C315.2	To understand the operation of single phase full–wave converters and three phase full–wave converters.
C315.3	To understand the operation three Phase full–wave converters. And also the operation of different types of DC-DC converters.
C315.4	To understand the operation of inverters and application of PWM techniques for voltage control and harmonic mitigation.
C315.5	Analyse the operation of single phase AC-AC voltage regulators.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C315.1	2	1	2	2	1	2	---	---	2	---	---	1
C315.2	1	2	2	1	2	---	---	---	1	---	1	2
C315.3	2	2	3	2	1	---	---	---	2	---	2	2
C315.4	1	2	2	2	1	2	---	---	2	1	3	2
C315.5	1	2	3	2	1	2	---	---	2	2	3	2
C315	1.4	1.8	2.4	1.8	1.2	2	----	----	1.8	1.5	2.25	1.8

	PSO1	**PSO2**	**PSO3**
C315.1	3	1	2
C315.2	2	3	3
C315.3	2	2	3
C315.4	3	2	2
C315.5	2	3	3
C315	2.4	2.2	2.6

Course Name: Electrical Machines-2 Lab **(C316)**

Subject Name: **Electrical Machines-2 Lab**	Subject Code: **R1631026**
C316.1	Able to assess the performance of single phase and three phase induction motors.
C316.2	Able to control the speed of three phase induction motor.
C316.3	Able to predetermine the regulation of three–phase alternator by various methods
C316.4	Able to find the Xd/ Xq ratio of alternator and asses the performance of three–phase synchronous motor
C316.5	Able to improve power factor for single phase Induction Motor

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C316.1	3	3	3	3	3	-	-	-	--	--	2	1
C316.2	3	3	3	3	3	-	-	-	-	-	2	1
C316.3	3	3	3	3	3	-	-	-	-	-	2	1
C316.4	3	3	3	3	2	-	-	-	-	-	2	1
C316.5	3	3	3	3	2	-	-	-	-	-	2	--
C316	3	3	3	3	2.6	-	----	----	----	----	2	1

	PSO1	**PSO2**	**PSO3**
C316.1	3	3	3
C316.2	3	3	3
C316.3	3	3	3
C316.4	3	3	3
C316.5	3	3	3
C316	3	3	3

Course Name: Control systems Lab **(C317)**

Subject Name: **Control systems Lab**	Subject Code: **R1631027**
C317.1	Able to analyze the performance and working Magnetic amplifier, D.C and A.C. servo motors and PMDC motors.
C317.2	Able to design and devilment of lag, lead and lag–lead compensators
C317.3	Able determine the transfer function of D.C. motor
C317.4	Able to understand the working of control the position of D.C servo motor performance.
C317.5	Able to understand the Characteristics of synchros and determine the time domain specifications of second order system.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C317.1	1	2	3	2	1	2	2	--	2	2	3	2
C317.2	2	1	3	2	2	--	1	--	3	2	3	1
C317.3	2	2	3	1	--	2	--	--	--	2	2	2
C317.4	1	2	2	2	--	--	2	--	3	--	3	3
C317.5	2	2	3	3	2	--	--	--	2	--	2	2
C317	1.6	1.8	2.8	2.0	1.67	2.0	1.67	--	1.5	2.0	2.6	2.0

	PSO1	**PSO2**	**PSO3**
C317.1	2	2	2
C317.2	2	3	3
C317.3	1	3	1
C317.4	2	2	2
C317.5	2	1	2
C317	1.8	2.2	2.0

Course Name: Electrical Measurement Lab (C318)

Subject Name: **Electrical Measurement Lab**	Subject Code: **R1631028**
C318.1	Student able to measure resistance, inductance and capacitance,
C318.2	Students able to measure 3-Φ active power and reactive power using different methods.
C318.3	Students able to calibrate and test single phase energy meter, calibrate PMMC voltmeter and calibrate LPF wattmeter
C318.4	To be able to test transformer oil for its effectiveness
C318.5	To be able to measure the parameters of inductive coil

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C318.1	2	3	3	3	2	--	---	--	--	---	2	2
C318.2	2	3	3	2	2	--	---	--	--	----	2	2
C318.3	2	2	2	2	2	--	---	--	--	----	2	2
C318.4	1	1	1	2	----	--	----	--	--	---	1	1
C318.5	1	1	1	2	--	----	----	----	----	----	1	1
C318	1.6	2	2	2.2	1.2	----	-----	----	-----	----	1.6	1.6

	PSO1	**PSO2**	**PSO3**
C318.1	2	2	3
C318.2	2	2	3
C318.3	2	2	3
C318.4	--	--	1
C318.5	----	1	1
C318	1.2	1.4	2.2

6th Semester

Course Name: Power Electronic Controllers & Drives (C321)

Subject Name: **Power Electronic Controllers & Drives**	Subject Code: **R1632021**
C321.1	Understanding the fundamentals of electric drive and different electric braking methods. And also able to analyze the operation of single phase converter fed DC motors and four quadrant operations of DC motors.
C321.2	Understand the concept of DC-DC converter control of DC motors and closed loop control of DC Drives.
C321.3	Understand the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.
C321.4	Differentiate the stator side control and rotor side control of three phase induction motor.
C321.5	Understand the concept of speed control mechanism of synchronous motors.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C321.1	2	1	2	---	1	---	---	---	1	---	---	1
C321.2	1	2	2	1	2	---	---	---	1	---	1	1
C321.3	2	2	3	2	1	---	---	---	1	---	2	2
C321.4	1	2	2	2	1	1	---	---	2	1	2	2
C321.5	1	2	3	2	1	1	---	---	2	1	2	1
C321	1.4	1.8	2.4	1.75	1.2	1	---	---	1.4	1	1.75	1.4

	PSO 1	PSO 2	PSO3
C321.1	2	3	2
C321.2	2	2	3
C321.3	2	3	2
C321.4	1	2	1
C321.5	2	3	2
C321	1.8	2.6	2

Course Name: Power Systems Analysis (C322)

Subject Name: **Power Systems Analysis**	Subject Code: **R1632022**
C322.1	Students can understand the per unit quantity representation and able to develop per unit reactance diagram and Y bus matrices of a power system network.
C322.2	Students will able to develop and Z bus matrices of a power system network by using different techniques.
C322.3	Students can solve load flow problems of the interconnected power system network by different iterative methods.
C322.4	Students able to do symmetrical short circuit analysis
C322.5	Students able to do unsymmetrical short circuit analysis and can understand the importance of power system stability

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C322.1	2	1	3	3	2	---	---	---	---	---	2	2
C322.2	3	2	2	3	3	---	---	---	---	---	2	2
C322.3	3	2	3	3	3	---	---	---	---	---	3	2
C322.4	2	2	2	3	1	---	---	---	---	---	2	2
C322.5	3	2	3	3	3	---	---	---	---	---	3	2
C322	2.6	1.8	2.6	3	2.4	---	---	---	---	---	2.4	2

	PSO1	**PSO2**	**PSO3**
C322.1	1	1	3
C322.2	2	2	3
C322.3	3	1	3
C322.4	1	1	3
C322.5	3	2	3
C322	2	1.4	3

Course Name: Microprocessors And Microcontrollers **(C323)**

Subject Name: **Microprocessors And Microcontrollers**	Subject Code: **R1632023**
C323.1	To be able to understand the microprocessor capability in general and explore the evaluation of microprocessors.
C323.2	To be able to understand the addressing modes of microprocessors
C323.3	To be able to understand the microcontroller capability
C323.4	To be able to program and interface mp and mc with other electronic devices
C323.5	To be able to develop cyber physical systems

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C323.1	2	3	3	3	3	-	-	-	2	1	1	3
C323.2	2	3	3	3	3	-	-	-	2	1	1	3
C323.3	3	3	3	3	3	-	-	-	2	1	1	3
C323.4	3	3	3	3	3	-	-	-	2	1	1	3
C323.5	3	3	3	3	3	-	-	-	2	1	1	3
C323	2.6	3	3	3	3	-	---	---	2	1	1	3

	PSO1	**PSO2**	**PSO3**
C323.1	1	2	1
C323.2	2	2	2
C323.3	1	2	2
C323.4	2	1	2
C323.5	1	1	1
C323	1.4	1.6	1.6

Course Name: Data Structures **(C324)**

Subject Name: **Data Structures**	Subject Code: **R1632024**
C324.1	Understanding the concept of Dynamic Programming, Memory Management, Data Types, Algorithms, and Big O Notations.
C324.2	Understand Basic Data Structures Such as Arrays, Linked Lists, Stacks & Queues.
C324.3	Describe the Hash Functions & Concept of Collisions & its resolution Techniques.
C324.4	Solve Problem Involving Graphs, Trees & Heaps.
C324.5	Apply Algorithm for solving problems like Sorting, Searching, Insertion, & deletion of Data.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C324.1	3	-	3	-	-	-	-	-	-	-	-	1
C324.2	2	-	2	-	-	-	-	-	-	-	-	1
C324.3	2	-	2	-	-	-	-	-	-	-	-	1
C324.4	2	-	2	-	-	-	-	-	-	-	-	1
C324.5	2	-	2	-	-	-	-	-	-	-	-	1
C324	2.2	-	2.2	-	-	-	-	-	-	-	-	1

	PSO1	**PSO2**	**PSO3**
C324.1	2	1	1
C324.2	2	1	1
C324.3	3	1	1
C324.4	3	1	1
C324.5	3	1	1
C324	2.6	1	1

Course Name: Energy Audit & Conservation Management **(C325)**

Subject Name: **Energy Audit & Conservation Management**	Subject Code: **R163202F**
C325.1	Explain energy efficiency, conservation and various technologies.
C325.2	Design energy efficient lighting systems.
C325.3	Calculate power factor of systems and propose suitable compensation techniques.
C325.4	Explain energy conservation in HVAC systems.
C325.5	Calculate life cycle costing analysis and return on investment on energy efficient technologies.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C325.1	2	1	3	1	2	-	-	-	-	-	1	1
C325.2	2	2	3	2	1	-	-	-	-	-	1	1
C325.3	2	2	3	1	1	-	-	-	-	-	1	0
C325.4	2	2	2	1	1	-	-	-	-	-	1	1
C325.5	2	1	1	2	1	-	-	-	-	-	1	1
C325	2	1.6	2.4	1.4	1.2	-	-	-	-	-	1	1

	PSO1	**PSO2**	**PSO3**
C325.1	2	2	3
C325.2	2	2	2
C325.3	3	1	3
C325.4	1	1	3
C325.5	3	2	3
C325	2.2	1.6	2.8

Course Name: Power Electronics Lab **(C326)**

Subject Name: **Power Electronics Lab**	Subject Code: **R1632026**
C326.1	Able to study the characteristics of various power electronic devices and analyse firing circuits and commutation circuits of SCR
C326.2	Able to analyse the performance of single–phase and three–phase full–wave bridge converters with both resistive and inductive loads.
C326.3	Able to understand the operation of AC voltage regulator with resistive and inductive loads.
C326.4	Able to understand the working of Buck converter, Boost converters in continuous conduction and discontinues conduction modes.
C326.5	Able to understand the working of square wave and PWM inverters with different loads.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C326.1	2	2	2	1	--	--	--	--	--	1	3	2
C326.2	1	2	3	2	--	--	--	--	1	1	2	1
C326.3	1	2	3	2	2	2	2	--	2	--	3	2
C326.4	1	2	3	2	2	3	1	--	3	--	2	3
C326.5	1	3	3	3	2	2	3	--	2	--	3	3
C326	1.2	2.2	2.8	2	2	2.33	2	--	2	1	2.6	2.2

	PSO1	**PSO2**	**PSO3**
C326.1	1	2	1
C326.2	1	2	3
C326.3	2	2	3
C326.4	2	3	2
C326.5	2	3	2
C326	1.6	2.4	2.2

Course Name: Microprocessors and Microcontrollers Lab **(C327)**

Subject Name: **Microprocessors and Microcontrollers Lab**	Subject Code: **R1632027**
C327.1	Analyze and apply working of 8086, 8051.
C327.2	Apply the working of 8086 develop the programs.
C327.3	Compare the various interface techniques
C327.4	Analyze and apply the working of 8255, 8279, 8259, 8251, 8257 ICs and design and develop the programs.
C327.5	Learning the Communication Standards.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C327.1	3	3	3	3	3	-	-	-	2	1	2	3
C327.2	3	3	3	3	3	-	-	-	2	1	2	3
C327.3	3	3	3	3	3	-	-	-	2	1	2	3
C327.4	3	3	3	3	3	-	-	-	2	1	2	3
C327.5	3	3	3	3	3	-	-	-	2	1	2	3
C327	3	3	3	3	3	-	----	----	2	1	2	3

	PSO1	**PSO2**	**PSO3**
C327.1	3	3	3
C327.2	3	3	3
C327.3	3	3	3
C327.4	3	3	3
C327.5	3	3	3
C327	3	3	3

Course Name: Data Structures **Lab (C328)**

Subject Name: **Data Structures Lab**	Subject Code: **R1632028**
C328.1	Students will be able to design and analyse the time and space efficiency of the data structure.
C328.2	Students are capable to identify the appropriate data structure for given problem
C328.3	Students will have practical knowledge on the application of data structures.
C328.4	Make use of Graphs to Develop C programs to like Graphs Traversal Algorithms, Minimum Spanning tree Algorithm
C328.5	Develop C programs for several recursive non recursive Sorting Techniques.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C328.1	1	2	1	3	--	--	--	--	--	--	--	1
C328.2	1	2	1	2	--	--	--	--	--	--	--	1
C328.3	1	1	1	2	--	--	--	--	--	--	--	1
C328.4	2	2	2	2	--	--	--	--	--	--	--	1
C328.5	3	2	3	2	--	--	--	--	--	--	--	1
C328	1.6	1.8	1.6	2.2	--	--	--	--	--	--	--	1

CO	**PSO1**	**PSO2**	**PSO3**
C328.1	1	1	2
C328.2	1	1	2
C328.3	1	1	2
C328.4	1	1	2
C328.5	1	1	2
C328	1	1	2

7th Semester

Course Name: Utilization of Electrical Energy **(C411)**

Subject Name: **Utilization of Electrical Energy**	Subject Code: **R1641021**
C411.1	Students will able to identify suitable motors for electric drives and industrial applications
C411.2	Students will able to understand different heating and welding methods
C411.3	Students will able to understand the basic principles of Illumination, lighting systems and its design.
C411.4	Students will able to understand the basic principles of Electric traction and speed time curves of different services.
C411.5	Students will able to calculate the tractive effort and specific energy consumption of locomotives.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C411.1	3	3	2	-	-	-	-	-	-	-	-	-
C411.2	3	3	3	-	-	-	-	-	-	-	-	-
C411.3	3	3	3	2	1	-	1	-	-	-	-	2
C411.4	3	3	3	2	1	-	1	-	-	-	-	2
C411.5	3	3	3	2	1	-	1	-	-	-	-	2
C411	3	3	2.8	1.2	0.6	0	0.6	0	0	0	0	1.2

	PSO1	**PSO2**	**PSO3**
C411.1	2	-	2
C411.2	2	-	2
C411.3	2	-	2
C411.4	2	-	2
C411.5	2	-	2
C411	2	0	2

Course Name: Linear Ic Applications **(C412)**

Subject Name: **Linear Ic Applications**	Subject Code: **R1641022**
C412.1	Design circuits using operational amplifiers for various applications.
C412.2	Illustrate the basic principles and practical limitations of Op-amp.
C412.3	Design Linear and Non-linear circuits using Op-amp. Analyse Frequency generators active filters and voltage regulators.
C412.4	Describe the internal functional blocks of special ICs like Timer and PLL.
C412.5	Design and analyse ADC & DAC converters

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C412.1	1	1	2	1	----	1	1	----	----	----	----	----
C412.2	2	1	2	----	-----	1	1	----	----	----	----	----
C412.3	2	2	2	----	1	---	1	----	----	----	----	----
C412.4	2	2	2	----	----	1	1	----	----	----	----	----
C412.5	2	1	2	2	1	----	----	----	----	----	----	1
C412	1.8	1.4	2	0.6	0.4	0.6	0.8	----	----	----	----	0.2

	PSO 1	**PSO2**	**PSO3**
C412.1	1	1	----
C412.2	1	1	----
C412.3	1	----	1
C412.4	1	1	----
C412.5	1	1	----
C412	1	1	1

Course Name: Power System Operation and Control (C413)

Subject Name: **Power System Operation and Control**	Subject Code: **R1641023**
C413.1	Understand the concept of economic operation of thermal power systems with and without considering line losses.
C413.2	Understand the concept of Hydro thermal Scheduling and solution techniques.
C413.3	Understand the concept of unit commitment problem and solution techniques.
C413.4	Understand the importance of the load frequency control of single area and two area systems with and without controllers.
C413.5	Understand the concept of reactive power control and compensation for transmission line.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C413.1	3	2	---	2	1	2	1	---	---	---	---	---
C413.2	3	2	---	2	2	1	1	---	---	---	---	---
C413.3	3	2	---	2	2	1	1	---	---	---	---	---
C413.4	3	2	---	2	1	1	2	---	---	---	---	2
C413.5	3	2	---	2	2	2	1	---	---	---	---	2
C413	3	2	---	2	1.6	1.4	1.2	---	---	---	---	2

	PSO1	**PSO2**	**PSO3**
C413.1	2	1	1
C413.2	3	2	2
C413.3	3	2	2
C413.4	3	2	2
C413.5	2	2	1
C413	2.6	1.8	1.6

Course Name: Switch Gear & Protection (C414)

Subject Name: **Switch Gear & Protection**	Subject Code: **R1641024**
C414.1	To provide the basic principles and operation of various types of circuit breakers. and study the classification, operation and application of different types of electromagnetic protective relays.
C414.2	To explain protective schemes, for generator and transformers.
C414.3	To impart knowledge of various protective schemes used for feeders and bus bars.
C414.4	To explain the principle and operation of different types of static relays.
C414.5	To study different types of over voltages in a power system and principles of different protective schemes for insulation co–ordination.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C414.1	2	1	2	1	----	1	----	----	----	----	----	1
C414.2	2	2	2	2	----	1	----	----	----	----	----	1
C414.3	2	2	1	2	----	1	----	----	----	----	----	1
C414.4	2	1	1	2	----	1	----	----	----	----	----	1
C414.5	1	1	1	1	---	1	----	----	----	----	----	1
C414	1.8	1.4	1.4	1.8	---	1	----	----	----	----	----	1

	PSO1	**PSO2**	**PSO3**
C414.1	2	1	2
C414.2	2	1	2
C414.3	2	1	2
C414.4	2	1	2
C414.5	2	1	2
C414	2	1	2

Course Name: Instrumentation (C415)

Subject Name: **Instrumentation**	Subject Code: **R164102D**
C415.1	To study various types of signals and their representation.
C415.2	To study various types of transducers: Electrical, Mechanical, Electromechanical, Optical etc.
C415.3	To study and measure the various types of Non–electrical quantities.
C415.4	To study various types of digital voltmeters
C415.5	To study the working principles of various types of oscilloscopes and their applications, & various types of signal analyzers

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C415.1	3	3	1	1	1	--	--	---	--	--	--	--
C415.2	3	1	1	--	2	1	--	--	--	--	--	--
C415.3	3	1	--	--	1	--	--	--	--	--	--	--
C415.4	3	2	1	1	2	1	--	--	--	--	--	--
C415.5	3	2	1	1	3	1	--	--	--	--	--	--
C415	3	1.8	1	1	1.8	1	0	0	0	0	0	0

	PSO 1	PSO 2	PSO3
C415.1	2	2	2
C415.2	3	3	3
C415.3	1	1	1
C415.4	2	3	2
C415.5	1	2	2
C415	1.8	2.2	2

Course Name: Special Electrical Machines **(C416)**

Subject Name: **Special Electrical Machines**	Subject Code: **R164102G**
C416.1	To describe the operation and characteristics of permanent magnet dc motor.
C416.2	To explain the performance and control of stepper motors, and their applications.
C416.3	To explain theory of operation and control of switched reluctance motor.
C416.4	To distinguish between brush dc motor and brush less dc motor**.**
C416.5	To explain the theory of travelling magnetic field and applications of linear motors.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C416.1	2	2	1	1	----	1	2	----	----	----	----	1
C416.2	3	2	1	1	----	----	2	----	----	----	----	1
C416.3	2	2	1	1	1	1	1	----	----	----	----	1
C416.4	3	2	2	2	1	1	1	----	----	----	----	1
C416.5	2	2	1	1	1	1	1	----	----	----	----	1
C416	2.4	2	1.2	1.2	0.6	0.8	1.4	----	----	----	----	1

	PSO1	**PSO2**	**PSO3**
C416.1	3	2	1
C416.2	3	2	1
C416.3	3	2	2
C416.4	2	2	2
C416.5	3	2	1
C416	2.8	2	1.4

Course Name: Electrical Simulation Laboratory (C417)

Subject Name: **Electrical Simulation Laboratory**	Subject Code: **R1641027**
C417.1	To simulate the RLC circuits for different inputs
C417.2	To simulate transmission line by incorporating line, load and transformer models.
C417.3	To study the stability of second order systems
C417.4	To simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, and Full convertor and PWM inverter.
C417.5	To simulate Full convertor and PWM inverter.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO1
C417.1	1	2	1	2	1	--	1	--	--	----	---	---
C417.2	1	1	1	1	1	--	1	--	--	1	----	----
C417.3	1	1	1	1	1	--	1	--	--	2	--	----
C417.4	2	2	1	1	1	--	1	--	--	1	---	---
C417.5	2	2	1	----	1	----	1	----	----	1	----	-------
C417	1.2	1.4	1	1	1	--	1	--	--	1	---	---

	PSO 1	PSO2	PSO3
C417.1	2	2	1
C417.2	2	2	3
C417.3	2	1	2
C417.4	2	1	1
C417.5	2	1	1
C417	2	1.5	1.75

Course Name: Power Systems& Simulation Laboratory (C418)

Subject Name: **Power Systems& Simulation Laboratory**	Subject Code: **R1641028**
C418.1	Understand the sequence impedance of transformer and alternator by different methods
C418.2	Able to calculate ABCD parameters of transmission line
C418.3	Understand and solve the different load flow methods
C418.4	Understand the transient stability analysis
C418.5	Understand the economic load dispatch and load frequency control

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO1
C418.1	2	2	2	2	2	--	--	--	--	--	1	--
C418.2	3	2	2	2	2	--	--	--	--	--	1	--
C418.3	2	2	3	2	2	--	--	--	--	--	1	--
C418.4	2	3	2	3	2	--	--	--	--	--	1	--
C418.5	3	2	2	3	2	--	--	--	--	--	1	--
C418	2.4	2.2	2.2	2.4	2	--	--	--	--	--	1	--

	PSO 1	PSO 2	PSO3
C418.1	2	2	3
C418.2	2	2	3
C418.3	2	2	3
C418.4	2	2	3
C418.5	2	2	3
C418	2	2	3

8th Semester

Course Name: Digital Control Systems (C421)

Subject Name: **Digital Control Systems**	Subject Code: **R1642021**
C421.1	The students will understand the concepts of digital control systems and assemble various components associated with it
C421.2	The students will be able to make use of application of Z-transformations for the mathematical analysis of digital control systems
C421.3	The Student can represent the discrete–time systems in state–space model and can evaluate state transition matrix
C421.4	The student can examine the stability of the digital systems using different methods adopted for testing.
C421.5	The student is able to use conventional and state space methods of analyzing and design of digital control systems.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C421.1	2	2	3	---	----	----	----	----	----	----	2	1
C421.2	3	2	1	----	----	----	----	----	----	----	2	----
C421.3	3	2	1	2	----	----	----	----	----	----	1	----
C421.4	2	1	1	2	----	----	----	----	----	----	----	1
C421.5	2	1	2	1	----	----	----	----	----	----	----	1
C421	2.6	1.6	1.6	1	----	----	----	----	----	----	1	0.6

	PSO1	**PSO2**	**PSO3**
C421.1	1	1	3
C421.2	---	1	3
C421.3	----	2	3
C421.4	----	1	2
C421.5	----	2	2
C421	0.2	1.4	2.6

Course Name: HVDC Transmission (C422)

Subject Name: **HVDC Transmission**	Subject Code: **R1642022**
C422.1	To Understand basic concepts of HVDC Transmission
C422.2	To analyze and control the different converter configuration in HVDC Transmission
C422.3	To Understand the significance of reactive power control and AC/DC load flow and AC filters
C422.4	To Know different converter faults, protection and effect of harmonics
C422.5	To understand and design low pass and high pass filters

	PO1	PO	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C422.1	3	----	----	----	3	----	----	----	----	1	1	1
C422.2	3	3	2	2	----	----	----	----	----	----	----	----
C422.3	2	2	2	2	2	----	----	----	----	----	2	2
C422.4	----	3	3	----	----	----	----	----	----	----	----	----
C422.5	3	3	3	1	3	----	----	----	----	----	1	1
C422	2.75	2.75	2.5	1.66	2.66	----	----	----	----	1	1.33	1.33

	PSO 1	PSO 2	PSO3
C422.1	3	3	2
C422.2	2	3	2
C422.3	1	----	2
C422.4	1	3	1
C422.5	2	2	1
C422	1.8	2.75	1.6

Course Name: Electrical Distribution Systems (C423)

Subject Name: **Electrical Distribution Systems**	Subject Code: **R1642023**
C423.1	Able to understand various factors and their calculations of distribution system
C423.2	Able to design the substation and feeders
C423.3	Able to determine the voltage drop and power loss
C423.4	Able to understand the protection and its coordination
C423.5	Able to understand the effect of compensation for p.f improvement, effect of voltage control and their calculations

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C423.1	2	2	1	1	3	----	1	----	----	1	1	2
C423.2	1	2	3	1	3	1	2	----	2	1	1	2
C423.3	2	3	2	1	3	1	1	----	1	1	1	2
C423.4	1	----	1	----	1	1	1	----	1	2	1	2
C423.5	2	2	---	---	---	1	---	----	---	1	1	2
C423	1.6	2.25	1.75	1	2.5	1	1.25	---	1.33	1.2	1	2

	PSO 1	**PSO 2**	**PSO3**
C423.1	1	2	1
C423.2	1	2	1
C423.3	3	1	2
C423.4	1	2	2
C423.5	1	1	2
C423	1.4	1.6	1.6

Course Name: FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS (C424)

Subject Name: **FACTS**	Subject Code: **R164202B**
C424.1	Understanding the basics of power flow control in transmission lines using FACTS controllers
C424.2	Understand the compensation methods to improve stability and reduce power oscillations of a power system.
C424.3	Understanding the method of shunt compensation using static VAR compensators. and series compensators
C424.4	Understanding the operation of Unified Power Flow Controller (UPFC).
C424.5	Understanding the Power Quality issues.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C424.1	1	2	2	2	1	1	----	----	----	----	----	----
C424.2	2	2	2	1	----	1	----	----	----	----	----	----
C424.3	2	2	2	----	2	----	----	----	----	----	----	----
C424.4	2	1	2	1	1	1	----	----	1	----	----	----
C424.5	2	2	2	2	1	2	---	---	1	----	----	-----
C424	1.8	1.8	2	1	1	1	----	----	0.4	----	----	----

	PSO1	**PSO2**	**PSO3**
C424.1	2	3	2
C424.2	3	2	2
C424.3	2	1	2
C424.4	2	2	3
C424.5	2	2	2
C424	2.2	2	2

Course Name: Seminar (C425)

C425.1	Identify a topic in advanced areas of Electrical Engineering.
C425.2	Identify and compare technical and practical issues related to the area of interest
C425.3	Analyses the references/bibliography related to topic
C425.4	Prepare a well-organized report including elements of technical writing and critical Thinking
C425.5	Interpret and Communicate technical issues and recent developments through Presentation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C425.1	3	3	3	3	3	3	3	3	3	3	3	3
C425.2	3	3	3	3	3	3	3	3	3	3	3	3
C425.3	3	3	3	3	3	3	3	3	3	3	3	3
C425.4	3	3	3	3	3	3	3	3	3	3	3	3
C425.5	3	3	3	3	3	**-**	-	-	-	-	3	**-**
C425	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

	PSO1	**PSO2**	**PSO3**
C425.1	3	3	3
C425.2	3	3	3
C425.3	3	3	3
C425.4	3	3	3
C425.5	3	3	3
C425	3	3	3

Course Name: Project (C426)

C426.1	Identify various areas of Electrical & Electronics Engineering that defines the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.
C426.2	Identify methods and materials to carry out experiments/simulations/development
C426.3	Reorganize the procedures of design, development & manufacturing with a concern for society, environment and ethics.
C426.4	Analyze and discuss the results to draw valid conclusions.
C426.5	Prepare a report as per recommended format and defend the work.

	PO	PO	PO3	PO	PO5	PO6	PO	PO8	PO9	PO10	PO11	PO12
C426.1	2	3	3	2	1	1	1	1	1	1	2	1
C426.2	3	2	1	2	1	1	1	1	1	1	2	1
C426.3	3	1	1	2	1	2	1	1	1	1	2	1
C426.4	1	2	1	2	1	2	1	1	1	1	2	1
C426.5	2	1	3	2	2	1	1	1	1	2	2	2
C426	2.2	1.8	1.8	2	1.2	1.4	1	1	1	1.2	2	1.2

	PSO1	**PSO2**	**PSO3**
C426.1	1	2	3
C426.2	1	3	2
C426.3	2	3	2
C426.4	2	2	2
C426.5	3	2	2
C426	1.8	2.4	2.2