BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
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BETHLAHEM INSTITUTE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES

AND

CO-PO MAPPING

BETHLAHEM INSTITUTE OF ENGINEERING
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulation 2021

List of Course Names

Sl. No	Course Code	Course Title	L	T	P	C
SEMESTER-I						
1	IP3151	Induction Programme				
2	HS3151	Professional English - I	3	0	0	3
3	MA3151	Matrices and Calculus	3	1	0	4
4	PH3151	Engineering Physics	3	0	0	3
5	CY3151	Engineering Chemistry	3	0	0	3
6	GE3151	Problem Solving and Python Programming	3	0	0	3
7.	GE3152	தமிழர் மரபு /Heritage of Tamils	1	0	0	1
8	GE3171	Problem Solving and Python Programming Laboratory	0	0	4	2
9	BS3171	Physics and Chemistry Laboratory	0	0	4	2
10	GE3172	English Laboratory	0	0	2	1
SEMESTER-II						
1	HS3251	Professional English - II	2	0	0	2
2	MA3251	Statistics and Numerical Methods	3	1	0	4
3	PH3254	Physics for Electronics Engineering	3	0	0	3
4	BE3254	Electrical and Instrumentation Engineering	3	0	0	3
5	GE3251	Engineering Graphics	2	0	4	4
6	EC3251	Circuit Analysis	3	1	0	4
7	GE3252	தமிழரும் ததொழில் நுட்பமும்/Tamils and Technology	1	0	0	1
8	GE3271	Engineering Practices Laboratory	0	0	4	2
9	EC3271	Circuits Analysis Laboratory	0	0	2	1
10	GE3272	Communication Laboratory / Foreign Language $	0	0	4	2
SEMESTER-III						
1.	MA3355	Random Processes and Linear Algebra	3	1	0	4
2	CS3353	C Programming and Data Structures	3	0	0	3
3	EC3354	Signals and Systems	3	1	0	4

4	EC3353	Electronic Devices and Circuits	3	0	0	3
5	EC3351	Control Systems	3	0	0	3
6	EC3352	Digital Systems Design	3	0	2	5
7	EC3361	Electronic Devices and Circuits Laboratory	0	0	3	3
8	CS3362	C Programming and Data Structures Laboratory	0	0	3	3
9	GE3361	Professional Development[$]	0	0	2	2
SEMESTER-IV						
1	EC3452	Electromagnetic Fields	3	0	0	3
2	EC3401	Networks and Security	3	0	2	4
3	EC3451	Linear Integrated Circuits	3	0	0	3
4	EC3492	Digital Signal Processing	3	0	2	4
5	EC3491	Communication Systems	3	0	0	3
6	GE3451	Environmental Sciences and Sustainability	2	0	0	2
7	EC3461	Communication Systems Laboratory	0	0	3	1.5
8	EC3462	Linear Integrated CircuitsLaboratory	0	0	3	1.5
SEMESTER-V						
1	EC3501	Wireless Communication	3	0	2	4
2	EC3552	VLSI and Chip Design	3	0	0	3
3	EC3551	Transmission lines and RF Systems	3	0	0	3
4	CEC366	Image Processing	3	0	0	3
5	CEC345	Optical Communication & Networks	3	0	0	3
6	CEC352	Satellite Communication	3	0	0	3
7	MX3084	Disaster Risk Reduction Management	3	0	0	0
8	EC3561	VLSI Laboratory	0	0	4	2

SEMESTER-VI						
1	ET3491	Embedded Systems and IOT Design	3	0	2	4
2	CS3491	Artificial Intelligence and Machine Learning	3	0	2	4
3	CEC339	Fundamentals of Nano Electronics	2	0	2	3
4	CEC348	Remote Sensing	3	0	0	3
5	CEC365	Wireless Sensor Network Design	3	0	0	3

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DEPARTMENT OF ECE

Regulation 2021

COURSE OUTCOMES AND CO PO MAPPING

YEAR	I	SEM	2	SUBJECT CODE	HS3151
SUBJECT	Professional English - I				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Create ideas and express them effectively
CO2	Improve interpersonal communication through personal and societal experiences
CO3	Describe the process effectively in diverse environments
CO4	Enhance mass communication skills
CO5	Participate effectively in public forums

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	3	3	-	-	-	3	-
CO2	-	-		-		-	-	-	**3**	3	-	-	-	3	-
CO3	-	-	-	-	-	-	3	-	-	3	-	-	-	3	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	3	-
CO5	-	--	-	-	-	2	-	-	3	3	-	-	-	3	-
AVG	-	-	-	-	-	**0.4**	**0.6**	-	**1.8**	**3**	-	-	-	**3**	-

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YEAR	I	SEM	2	SUBJECT CODE	MA3151
SUBJECT	Matrices and Calculus				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Know the different types of Matrices, properties of matrices and Cayley-Hamilton
CO2	Students are able to do different techniques of differentiation and easily identify the continuities
CO3	Understood about the partial differentiation and Lagrange calculation
CO4	Know the different techniques of integral calculus
CO5	CO5: Know the different kinds of integrals. understand how to find area and volume by using double and triple integrals

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	**2**	1	1	-	-	1	3	1	-	1	2	1	-
CO2	3	3	2	2	-	1	1	-	2	1	-	3	1	-	2
CO3	3	2	1	2	2	-	-	2	2	1	1	1	3	-	-
CO4	3	3	2	3	-	2	1	-	1	1	-	2	2	2	-
CO5	3	2	3	2	1	-	-	1	2	-	-	3	2	-	2
AVG	3	2.4	**2**	2	0.8	0.6	0.4	0.8	2	0.8	0.2	2	2	0.6	0.8

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YEAR	I	SEM	2	SUBJECT CODE	PH3151
SUBJECT	Engineering Physics				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the importance of mechanics.
CO2	Examine the concepts of electromagnetic waves.
CO3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
CO4	Explain the importance of quantum physics.
CO5	Apply quantum mechanical principles.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**2**	2	2	2	-	-	1	-	-	2	3	-	-
CO2	3	3	2	-	2	2	-	-	-	-	-	2	2	-	2
CO3	3	2	3	2	-	2	3	-	-	-	-	3	3	1	-
CO4	3	3	2	-	2	2	-	-	-	-	-	2	-	1	2
CO5	2	3	3	2	-	2	**1**	-	-	-	-	3	2	-	1
AVG	2.8	2.8	**2.4**	1.2	1.2	2	0.8	-	0.2	-	-	2.4	2	0.4	1

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YEAR	I	SEM	2	SUBJECT CODE	CY3151
SUBJECT	Engineering Chemistry				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	To understand the various water quality parameters and propose suitable methods for water treatment.
CO2	To identify and apply the basic concepts of nanoscience and nanotechnology for the production of nanomaterials to be applied for engineering and technological needs.
CO3	To acquire sound knowledge about phase rule and composites for the selection of materials.
CO4	Toanalyseand classify the available fuels for their appropriate use in industry.
CO5	To recognize the available forms of energy resources and their judicious use in energy sectors by providing due emphasis for attaining sustainable energy.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	**2**	-	**2**	2	2	-	-	-	-	2			
CO2	3	-	2	-	3	2	2	-	-	2	-	-			
CO3	3	-	2	-	3	2	1	-	-	2	-	-			
CO4	2	-	3	-	-	2	3	-	-	-	-	2			
CO5	3	-	3	-	2	**2**	**3**	-	-	-	-	3			
AVG	2.8	0.2	**2.4**	0	2	2	2.2	0	0	0.8	0	1.4			

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YEAR	I	SEM	1	SUBJECT CODE	GE3151
SUBJECT	Problem Solving and Python Programming				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the principles of problem solving techniques.
CO2	Write simple python programs
CO3	Develop programs based on control flow.
CO4	Analyze compound data using lists,tuples,dictionaries
CO5	Design files,modules & packages

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	3	-	-	-	-	3	1	3	-	-	3	2
CO2	3	3	3	3	-	-	-	-	3	1	3	-	-	1	2
CO3	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
CO4	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
CO5	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
AVG	3	3	**3**	3	2	-	-	-	3	1	3	-	-	2.6	2

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YEAR	I	SEM	1	SUBJECT CODE	GE3171
SUBJECT	Problem Solving and Python Programming Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Develop simple algorithms, Pseudo code, flowchart for simple problems.
CO2	Develop and execute simple Pythonprograms.
CO3	Build programsinPythonusingconditionals statement and loop statement.
CO4	Develop simple programs using functions and use Python data structures to implement programs.
CO5	Create files, packages and modules in python.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	3	-	-	-	-	3	1	3	-	3	3	2
CO2	3	3	3	3	-	-	-	-	3	1	3	-	1	1	2
CO3	3	3	3	3	2	-	-	-	3	1	3	-	3	3	2
CO4	3	3	3	3	2	-	-	-	3	1	3	-	3	3	2
CO5	3	3	3	3	2	-	-	-	3	1	3	-	3	2	2
AVG	3	3	**3**	3	1.2	-	-	-	3	1	3	-	2.6	2.4	2

YEAR	I	SEM	2	SUBJECT CODE	BS3171
SUBJECT	Physics and Chemistry Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Demonstrate different experiments to test basic understanding of physics concepts applied in optics.
CO2	Relate different experiments to test basic understanding of physics concepts applied in thermal physics.
CO3	Demonstratedifferent experiments to test basic understanding of physics concepts in properties of matter.
CO4	Develop practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
CO5	Examine the determination of molecular weight of a polymer by viscometer.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	3	3	-	-	-	-	2	-	1	3	1	-
CO2	3	3	3	1	3	2	-	2	-	-	-	1	1	-	1
CO3	3	3	3	1	3	-	-	-	1	-	-	1	-	1	-
CO4	3	3	3	-	-	2	-	-	-	-	-	-	-	-	-
CO5	3	3	3	-	-	-	-	-	1	-	-	1	-	1	1
AVG	3	3	**3**	1	1.8	0.8	-	0.4	0.4	0.4	-	0.8	0.8	0.6	0.4

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YEAR	I	SEM	2	SUBJECT CODE	HS3251
SUBJECT	Professional English - II				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Compare and contrast the ideas and products in a technical context.
CO2	Analyse the causes of events and represent them appropriately.
CO3	Explore the problems to arrive at suitable solutions for the same and present them in oral and written form.
CO4	Report events and processes on the technical contexts.
CO5	Present ideas logically and prepare job application letter with resume.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
CO2	-	-	-	-		3	3	-	-	-	-	-	-	-	2
CO3	-	3	3	3	-	-	2	-	-	3	-	-	-	-	2
CO4	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-
CO5	-	--	-	-	-	-	-	-	-	2	2	2	-	-	-
AVG	-	0.6	0.6	0.6	-	0.6	1	-	0.8	1.4	0.4	0.4	-	-	1.2

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YEAR	I	SEM	2	SUBJECT CODE	MA3251
SUBJECT	Statistics and Numerical Methods				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Know the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Know about the basic concepts of classifications of design of experiments in the field of agriculture.
CO3	Appreciate the numerical techniques of interpolation in various intervals and the numerical techniques of differentiation and integration for engineering problems.
CO4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	**3**	2	2	-	-	1	3	3	-	2	2	1	-
CO2	3	3	2	2	-	2	1	-	2	2	-	3	1	-	2
CO3	3	2	1	2	2	-	-	2	2	1	2	1	2	-	-
CO4	3	3	2	3	-	1	2	-	1	2	-	2	1	2	-
CO5	3	2	3	2	2	-	-	1	2	-	-	3	2	-	1
AVG	3	2.4	**2.2**	2.2	1.2	0.6	0.6	0.8	2	1.6	0.4	2.2	1.6	0.6	0.6

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YEAR	I	SEM	2	SUBJECT CODE	PH3254
SUBJECT	Physics for Electronics Engineering				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Introduce the basics of crystallography and its importance for varied material properties.
CO2	Examine the knowledge on the electrical properties of materials including free electron theory and magnetic materials.
CO3	Demonstrate the physics of semiconductors, determination of charge carriers and device applications.
CO4	Understand the optical properties of materials, optical displays and applications.
CO5	Apply the knowledge of nano structures, quantum confinement and ensuing nano device applications.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	**2**	2	-	2	2		-			3	2	1	3
CO2	3	3	3	2	2	2	2		1			3	3	1	1
CO3	3	3	1	1	3	3	3		2			3	1	1	3
CO4	3	2	3	2	2	2	2		1			3	3	2	1
CO5	3	3	3	1	2	2	**2**		1			3	1	1	2
AVG	3	2.4	**3**	1.6	2.2	2.2	2.2		1			3	2	1.2	2

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YEAR	I	SEM	2	SUBJECT CODE	BE3254
SUBJECT	Electrical and Instrumentation Engineering				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the basic principles and equivalent circuit of the transformer
CO2	Analyze the output characteristics of DC machines
CO3	Analyze the equivalent circuit and starting methods of AC rotating machines.
CO4	Explain the types and operations of measurements and instrumentations.
CO5	Explain the transmission and distribution of power systems.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	2	2	-	-	-	-	1	3	2	3
CO2	3	3	3	3	3	2	2	-	-	-	-	2	3	2	-
CO3	3	3	3	3	2	2	2	-	1	-	-	2	3	-	1
CO4	3	3	3	2	3	-	-	-	1	-	-	2	2	2	1
CO5	3	1	3	1	-	3	**2**	1	-	1	3	-	3	2	-
AVG	3	2.6	**3**	2.2	1.6	1.8	1.6	0.2	0.4	0.2	0.6	1.4	2.8	1.6	1

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YEAR	I	SEM	2	SUBJECT CODE	GE3251
SUBJECT	Engineering Graphics				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Construct the conic curves, involutes and cycloid.
CO2	Design the projection of points, lines and planes located in different quadrants.
CO3	Design the projection of sectioned solids and develop surfaces of a given objects.
CO4	Design the projection of solids and Produce orthographic projection of engineering components.
CO5	Create pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	**2**	-	-	-	-	-	-	1	-	-	1	-	-
CO2	1	-	2	-	-	-	-	-	-	1	-	-	1	-	-
CO3	1	-	2	-	-	-	-	-	-	1	-	-	1	2	-
CO4	1	-	2	-	-	-	-	-	-	1	-	-	1	2	-
CO5	1	-	2	-	-	-	-	-	-	1	-	-	1	2	-
AVG	1	-	**2**	-	-	-	-	-	-	1	-	-	1	1.2	-

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YEAR	I	SEM	02	SUBJECT CODE	EC3251
SUBJECT	Circuit Analysis				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the node voltage method for analysis of DC and AC circuits.
CO2	Apply suitable network theorems and analyze AC and DC circuits
CO3	Analyze steady state response of any R,Land C circuits
CO4	Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits
CO5	Analyze the coupled circuits and network topologies

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	-	-	-	-	2	-	3	3	2	3
CO2	3	3	3	3	2	2	-	-	-	-	-	2	2	-	2
CO3	3	3	3	-	2	2	1	-	-	-	-	3	2	1	1
CO4	3	3	3	2	3	-	-	2	2	-	-	2	-	-	-
CO5	3	2	3	2	-	-	2	-	2	1	1	-	2	-	1
AVG	3	2.8	3	1.8	1.8	0.8	0.6	0.4	0.8	0.6	0.2	2	2	0.6	1.4

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YEAR	I	SEM	2	SUBJECT CODE	GE3271
SUBJECT	Engineering Practices Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain all the fundamental concepts involving Electrical Engineering.
CO2	Createvarious electrical joints in common household electrical wire work.
CO3	Construct simple common household equipment.
CO4	Test simple electronic circuits.
CO5	Develop simple electronic components on PCB.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	2	3	2	-	-	2	-	3	2	2	-	2
CO2	3	-	3	2	-	2	-	-	2	-	-	2	2	-	2
CO3	3	3	2	2	2	-	-	-	1	-	-	2	2	-	-
CO4	3	3	3	3	3	2	-	-	3	-	3	3	2	-	-
CO5	-	3	2	1	1	-	-	-	1	-	-	2	2	-	-
AVG	2.4	2.4	**2.6**	2	1.8	1.2	-	-	1.8	-	1.2	2.2	2	-	0.8

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YEAR	I	SEM	2	SUBJECT CODE	EC3271
SUBJECT	Circuits Analysis Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Verify and Analyze KVL & KCL Theorems
CO2	Verify and Analyze Thevenin, Super Position Theorems & Norton theorem
CO3	Design and Analyze RL and RC circuits

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	-	-	2	-	1	3	1	2
CO2	3	3	3	1	3	2	-	2	-	-	-	1	1	-	3
CO3	3	3	3	1	3	-	-	-	1	-	-	1	-	-	-
AVG	3	3	3	1.6	3	0.6	-	0.4	0.3	0.4	-	1	1.3	0.3	1.6

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YEAR	I	SEM	3	SUBJECT CODE	MA3355
SUBJECT	Random Processes and Linear Algebra				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	The basic concepts in probability and random processes for applications such as random signals, linear systems in communication engineering
CO2	To understand the basic concepts of probability, one and two dimensional random variables and to introduce some standard distributions applicable to engineering which can describe real life phenomenon
CO3	To understand the basic concepts of random processes which are widely used in IT fields.
CO4	The fundamental concept of advanced algebra and their role in modern mathematics and applied contexts.
CO5	Apply their mastery by solving non trivial problems related to the concepts and by proving simple theorems about the statements proven by the text

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	**1**	1	-	-	-	-	1	-	1	-		1	-
CO2	2	2	1	1	-	1	2	1	1	2	-	2	2	1	-
CO3	3	2	-	2	2	-	2	-	2		-	2	3	-	-
CO4	3	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-	1	-	-
AVG	2.6	2.4	**1.2**	1	0.4	0.3	1	0.3	1	0. 4	0.3	1	1.4	0.4	-

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YEAR	I	SEM	3	SUBJECT CODE	CS3353
SUBJECT	C Programming and Data Structures				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	To Introduce the basics of C programming language
CO2	To learn the concepts of advanced features of C
CO3	To understand the concepts of ADTs and linear data structures
CO4	To know the concepts of non-linear data structure and hashing
CO5	To familiarize the concepts of sorting and searching techniques

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	-	-	–	-	-	1	2	1	2	2	2	2
CO2	3	3	3	-	-	-	-	-	1	2	1	2	2	2	3
CO3	3	2	3	1	-	-	-	-	-	-	-	-	-	3	-
CO4	3	2	3	1	-	-	-	-	-	-	-	-	-	3	3
CO5	3	3	3	1	3	-	-	-	-	-	-	-	-	1	3
AVG	3	2.6	3	1	3	-	-	-	1	2	1	2	2	2.2	2.75

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YEAR	I	SEM	3	SUBJECT CODE	EC3354
SUBJECT	Signals and Systems				

Students will be able

CO	COURSE OUTCOMES STATEMENT
CO1	Determine if a given system is linear/causal/stable
CO2	Analyze fourier and laplace transform
CO3	Characterizing LTI systems in the time domain and frequency domain of fourier and laplace transform
CO4	Analyze DTFT and Z transform
CO5	Characterizing LTI systems in the time domain and frequency domain of DTFT and Z transform domains

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	3	2	2	2	-	-	-	-	-	2	2	2	-	-
CO2	3	3	2	3	3	3	-	-	-	-	-	2	3	-	-
CO3	3	2	3	3	3	-	-	-	-	-	-	2	2	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	3	3	-	-
CO5	3	2	2	3	3	-	-	-	-	2	-	-	2	-	-
AVG	3	2.4	2.6	2.6	2.2	0.6	-	-	-	0.4	0.4	1.8	2.4	-	-

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YEAR	II	SEM	3	SUBJECT CODE	EC3353
SUBJECT	Electronic Devices and Circuits				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the structure and working operation of basic electronic devices
CO2	Design and analyze amplifiers
CO3	Analyze frequency response of BJT and MOSFET amplifiers
CO4	Design and analyze feedback amplifiers and oscillator principles
CO5	Design and analyze power amplifiers and supply circuits

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	2	3	-	-	-	-	-	2	2	2	-	1
CO2	2	2	3	-	3	2	2	-	-	2	3	1	3	1	1
CO3	2	3	3	3	1	2	2	-	-	3	2	3	3	3	3
CO4	3	-	-	3	1	3	3	-	-	3	2	3	3	3	3
CO5	3	3	2	-	1	3	**3**	-	-	3	2	3	3	3	3
AVG	2.6	2.2	**2.2**	1.6	1.8	2	2	-	-	2.2	2.2	2.4	2.8	2	2.2

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YEAR	I	SEM	3	SUBJECT CODE	EC3351
SUBJECT	Control Systems				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Apply various mathematical principles to find the transfer function of mechanical,electrical and electromechanical control systems.
CO2	Analyze the various time domain parameters.
CO3	Analyze the system in frequency domain through various frequency response plots and to design compensators for improving the performance of the system.
CO4	Apply the concepts of various system stability criterions on the systems.
CO5	Design and analyze the digital control system using state variable models

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	3	-	-	-	-	-	-	-	3	3	2	-
CO2	3	3	3	3	2	-	-	-	3	-	-	3	3	-	-
CO3	3	3	3	3	2	-	-	-	-	-	-	3	3	1	-
CO4	3	3	3	3	2	-	-	-	-	-	-	3	3	-	-
CO5	3	3	3	3	-	-	-	-	-	–	-	3	3	1	-
AVG	3	3	**3**	3	1.2	-	-	-	0.6	-	-	3	3	0.8	-

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YEAR	II	SEM	3	SUBJECT CODE	EC3352
SUBJECT	Digital Systems Design				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Apply Boolean algebra and simplification procedures to digital logic
CO2	Design various combinational digital circuits using logic gates
CO3	Analyze and design synchronous sequential circuits
CO4	Analyze and design asynchronous sequential circuits
CO5	Build logic gates and use programmable devices

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	2	-	-	-	3	-	-	2	-	-	2
CO2	3	3	3	2	-	-	-	-	3	-	-	2	3	2	-
CO3	3	3	3	2	-	-	-	-	3	-	-	2	3	2	-
CO4	3	3	3	2	-	-	-	-	3	-	-	2	3	2	-
CO5	3	1	-	-	-	-	-	-	-	2	-	2	-	-	-
AVG	3	2.2	1.8	1.2	0.4	-	-	-	2.4	0.4	-	2	1.8	1.2	0.4

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YEAR	I	SEM	3	SUBJECT CODE	EC3361
SUBJECT	Electronic Devices and Circuits Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Analyze the characteristics of PN Junction Diode and Zener Diode
CO2	Design and Testing of BJT and MOSFET amplifiers
CO3	Discuss the operation of power amplifiers

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	**3**	2	3	2	1	3	2	2	2	2	3	-	3
CO2	3	2	3	2	3	2	3	3	2	2	3	2	3	-	3
CO3	3	2	3	2	3	2	1	3	2	2	3	2	3	-	3
AVG	3	2	**3**	2	3	2	1.6	3	2	2	3	2	3	-	3

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YEAR	I	SEM	3	SUBJECT CODE	CS3362
SUBJECT	C Programming and Data Structures Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Write functions to implement linear and non-linear data structure operations
CO2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
CO3	Appropriately use the linear / non-linear data structure operations for a given problem
CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval
CO5	Ability to apply Sorting and searching Algorithms for give application

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	**2**	-	2	-	-	-	-	3	3	3	2	3	-
CO2	3	-	2	-	2	-	-	-	-	3	3	3	2	3	-
CO3	3	-	2	-	2	-	-	-	-	3	3	3	2	3	-
CO4	3	-	2	-	2	-	-	-	-	3	3	3	2	3	-
CO5	3	-	2	-	2	-	-	-	-	3	3	3	2	3	-
AVG	3	-	**2**	-	2	--	-	-	-	3	3	3	2	3	-

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YEAR	II	SEM	4	SUBJECT CODE	EC3452
SUBJECT	Electromagnetic Fields				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain Gradient, Divergence, and Curl operations on electromagnetic vector fields.
CO2	Explain electrostatic fields, electric potential, energy density and their applications
CO3	Calculate magneto static fields, magnetic flux density, vector potential.
CO4	Analyse different methods of emf generation and Maxwell's equations
CO5	Describe the concept of electromagnetic waves and characterizing parameters

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**2**	1	-	-	-	-	-	-	-	2	2	-	3
CO2	2	2	2	2	2	-	-	-	-	-	-	2	3	-	2
CO3	3	2	1	2	3	-	-	-	-	-	-	2	2	-	2
CO4	3	3	2	2	2	-	-	-	-	-	-	2	3	3	2
CO5	3	3	2	3	2	-	-	-	-	-	-	2	2	3	2
AVG	2.8	2.6	1.8	2	1.8	-	-	-	-	-	-	2	2.4	1.2	2.2

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YEAR	II	SEM	4	SUBJECT CODE	EC3401
SUBJECT	Networks and Security				

Students will able to

CO	COURSE OUTCOMES STATEMENT
CO1	Analyze the functions of each layer and gain knowledge in different applications that use computer networks
CO2	Discover the networking programs of protocols and IP addressing
CO3	Discuss the behaviors of various networking protocols like TCP,UDP and client server programming
CO4	Analyse the terminology and concepts of OSI security architecture and security services
CO5	Discusss the concept of hardware security like channel attacks and physical attack

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	**-3**	3	-	-	2	-	-	3	-	-	1	3	1
CO2	3	3	-2	2	-	-	3	-	-	3	-	-	2	-	3
CO3	2	3	3	2	3	3	-	-	-	2	-	-	1	-	1
CO4	3	2	-	3	3	1	-	-	-	-	-	2	3	3	2
CO5	3	3	-	2	-	-	-	-	-	1	-	-	3	2	-
AVG	2.8	2.4		2.4		0.8	1			1.8		0.4	0.7	1.6	1.4

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YEAR	II	SEM	4	SUBJECT CODE	EC3451
SUBJECT	Linear Integrated Circuits				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Describe the basic concepts and the internal circuit diagram of the Operational Amplifier.
CO2	Analyze the linear and non-linear applications of Operational Amplifiers.
CO3	Explain the multiplier IC and their applications and also describe the PLL ICs and their components.
CO4	Design ADC and DAC using Operational Amplifier.
CO5	Generate different waveforms using OP-AMP circuits and 555 Timers.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	1	-	-	-	-	-	-	-	2	3	-	2
CO2	3	3	2	2	3	-	-	-	-	-	-	3	2	-	2
CO3	3	3	2	2	-	-	-	-	-	3	-	2	2	-	2
CO4	3	3	3	2	-	-	2	-	-	-	-	2	3	-	2
CO5	3	3	2	2	-	-	-	-	-	2	-	3	3	-	2
AVG	3	3	2.4	1.8	0.6	-	0.4	-	-	1	-	2.4	2.6	-	2

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YEAR	II	SEM	4	SUBJECT CODE	EC3492
SUBJECT	Digital Signal Processing				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Apply DFT for the analysis of digital signals and systems
CO2	Design of IIR Filters
CO3	Design of FIIR Filters
CO4	Characterize the effects of finite precision representation on digital filters
CO5	Apply adaptive filters appropriately in communication systems

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	1	-	-	2	-	-	-	3	-	-	2	-	-	-
CO2	3	3	3	-	-	-	-	-	3	-	-	-	3	-	-
CO3	3	3	3	-	-	-	-	-	3	-	-	-	3	-	-
CO4	3	3	3	-	-	-	-	-	3	-	-	-	3	-	-
CO5	3	1	-	-	-	-	-	-	-	2	-	-	-	-	-
AVG	3	2.2	1.8	-	0.4	-	-	-	2.4	0.4	-	0.4	1.8	-	-

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YEAR	II	SEM	4	SUBJECT CODE	EC3491
SUBJECT	Communication Systems				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the principles of amplitude modulation techniques.
CO2	Apply the concepts of Random Process to the design of Communication systems.
CO3	Describe the various Digital techniques
CO4	Analyze the spectral characteristics of band pass signaling schemes and their noise performance.
CO5	Understand the principles of demodulation techniques

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	2	2	-	-
CO2	3	3	2	2	-	-	-	-		-	-	3	2	-	2
CO3	3	2	2	2	-	-	-	-	-	-	-	3	2	-	2
CO4	3	3	3	2	-	-	-	-	-	-	-	2	3	-	2
CO5	3	3	2	2	-	-	-	-	-	-	-	3	3	-	2
AVG	2.8	2.4	1.8	1.6								20.6	2.4		1.6

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YEAR	II	SEM	4	SUBJECT CODE	GE3451
SUBJECT	Environmental Sciences and Sustainability				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Understand the concept of Eco system and Bio diversity
CO2	Analyse the reasons for different types of pollution
CO3	Evaluate scarcity of all kind of natural resources and also find the reasons to avoid it
CO4	Remember the social issues like green chemistry, medical wastes, natural disaster
CO5	Apply the various concepts to reduce the population growth improve the women welfare

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	2	-	-	2	3	1	-	-	1	-	-	2	1
CO2	-	-	2	-	1	-	2	-	1	1	-	-	-	2	-
CO3	3	-	2	-	1	-	3	1	1	-	-	-	-	2	1
CO4	2	-	-	-	-	-	3	2	1	1	-	-	-	1	1
CO5	-	-	2	-	-	2	2	-	1	1	-	-	-	2	1
AVG	1	-	1.6	-	0.4	0.8	2.6	0.6	0.8	0.6	0.2	0.2	-	1.8	0.8

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YEAR	II	SEM	4	SUBJECT CODE	EC3461
SUBJECT	Communication Systems Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Demonstrate analog modulation and demodulation scheme
CO2	Demonstrate the digital modulation & Demodulation scheme
CO3	Demonstrate the concept of line coding techniques
CO4	Simulation of BPSK, QPSK & QAM signal constellation, ASK, FSK BPSK & DPSK digital modulation schemes using MATLAB.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	1	3	-	-	-	-	2	-	1	3	2	-
CO2	3	3	3	1	-	-	-	-	-	-	-	1	3	-	2
CO3	3	3	3	-	3	-	-	-	-	-	-	1	1	-	1
CO4	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-
AVG	3	3	**3**	0.5	2.25	-	-	-	-	0.5	-	0.75	2.5	0.5	0.75

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YEAR	II	SEM	4	SUBJECT CODE	EC3462
SUBJECT	Linear Integrated Circuits Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Analyze various types of feedback amplifiers
CO2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
CO3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators, filters using SPICE Tool.
CO4	Design D-A converters using operational amplifiers.
CO5	Design filters using op-amp and perform an experiment on frequency response

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	**3**	-	-	2	-	2	3	2	1	2	3	-	1
CO2	3	2	3	-	-	2	-	2	3	2	1	2	3	-	1
CO3	3	2	3	-	-	2	-	2	3	2	1	2	3	-	1
CO4	3	1	-	-	-	2	-	2	3	2	1	2	3	-	1
CO5	3	2	3	-	3	2	-	2	3	2	1	2	3	-	2
AVG	3	1.8	2.4	-	0.6	2	-	2	3	2	1	2	3	-	1.2

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YEAR	III	SEM	5	SUBJECT CODE	EC3501
SUBJECT	Wireless Communication				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Understand The Concept and Design of a Cellular System
CO2	Understand mobile radio propagation and various digital modulation techniques
CO3	Understand the concepts of multiple access techniques & wireless networks.
CO4	Characterize a wireless channel and evolve the system design specifications
CO5	Design a cellular system based on resource availability and traffic demands.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	3	2	1	-	-	-	1	-	2	1	3	3
CO2	3	3	3	3	2	1	1	1	-	-	-	-	-	3	3
CO3	3	3	3	3	2	-	-	-	-	-	-	2	1	3	3
CO4	3	3	3	3	-	-	-	1	-	-	-	-	-	3	3
CO5	3	3	-	-	-	2	-	-	-	-	-	-	3	3	2
AVG	3	3	2.4	2.4	1.2	.8	.2	.8	-	.2	-	.8	1	3	3

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YEAR	III	SEM	5	SUBJECT CODE	EC3552
SUBJECT	VLSI and Chip Design				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Realize the concepts of digital building blocks using MOS transistor.
CO2	Design combinational MOS circuits and power strategies.
CO3	Design and construct Sequential Circuits and Timing systems.
CO4	Design arithmetic building blocks and memory subsystems.
CO5	Apply and implement FPGA design flow and testing.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	1	-	-	-	-	-	-	-	2	3	-	2
CO2	3	3	2	2	-	-	-	-	-	-	-	3	2	-	2
CO3	3	3	2	2	-	-	-	-	-	3	-	2	2	-	2
CO4	3	3	3	2	-	-	2	-	-	-	-	2	3	-	2
CO5	3	3	2	2	-	-	-	-	-	2	-	3	3	-	2
AVG	3	3	2.4	1.8	-	-	0.1	-	-	0.3	-	2.4	2.6	-	2

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YEAR	III	SEM	5	SUBJECT CODE	EC3551
SUBJECT	Transmission lines and RF Systems				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	**CO1:** Explain the characteristics of transmission lines and its losses
CO2	Write about the standing wave ratio and input impedance in high frequency transmission lines
CO3	Analyze impedance matching by stubs using smith charts
CO4	Analyze the characteristics of TE and TM waves
CO5	Design a RF transceiver system for wireless communication

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	2	-	-	-	2	-	-	3	3	3
CO2	3	3	3	3	**2**	-	-	1	**-**	1	-	-	2	-	2
CO3	3	3	3	2	**2**	-	-	-	-	-	-	3	**2**	**-**	2
CO4	3	3	3	1	**3**	2	1	-	-	-	-	2	2	1	-
CO5	3	2	3	-	2	-	**2**	-	2	-	3	1	2	-	2
AVG	**3**	2.8	3	1.6	**1.8**	**0.8**	0.6	0.2	0.4	0.6	0.6	1.2	2.2	0.8	1.8

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YEAR	III	SEM	5	SUBJECT CODE	CEC366
SUBJECT	Image Processing				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
CO2	Operate on images using the techniques of smoothing, sharpening and enhancement.
CO3	Understand the restoration concepts and filtering techniques.
CO4	Learn the basics of segmentation, features extraction, compression and recognition methods for color models.
CO5	Comprehend image compression concepts.'

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	3	**3**	2	2	2	-	-	-	-	-	3	2	3	2
CO2	3	3	3	2	2	2	-	-	-	-	-	2	2	3	2
CO3	3	3	2	2	2	2	-	-	-	-	-	2	2	2	1
CO4	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
CO5	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1
AVG	3	3	2.8	2.2	2	2	-	-	-	-	-	2.2	2	2.4	1.4

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YEAR	III	SEM	5	SUBJECT CODE	CEC345
SUBJECT	Optical Communication and Networks				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Realize basic elements in optical fibers, different modes and configurations
CO2	Analyze the transmission characteristics associated with dispersion and polarization techniques
CO3	Design optical sources and detectors with their use in optical communication system
CO4	Construct fiber optic receiver systems, measurements and coupling techniques
CO5	Design optical communication systems and its networks

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**2**	3	3	1	-	-	-	-	-	1	2	1	2
CO2	3	3	2	1	3	2	-	-	-	-	-	2	2	2	2
CO3	3	2	3	3	2	1	-	-	-	-	-	1	2	2	2
CO4	3	2	2	2	2	1	-	-	-	-	-	1	2	1	2
CO5	3	3	3	3	2	1	-	-	-	-	-	1	2	2	2
AVG	3	2.6	2.4	2.4	2.4	1.2	-	-	-	-	-	1.2	2	1.6	2

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YEAR	III	SEM	5	SUBJECT CODE	CEC352
SUBJECT	Satellite Communication				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Describe the orbital parameters and launching procedures in satellite communications
CO2	Analyze the spacecraft technology and different subsystems in satellite
CO3	Explain the satellite link design and interference analysis
CO4	Analyse the multiple access methods like FDMA, TDMA, CDMA and coding schemes.
CO5	Explain the satellite series like INSAT, VSAT and analyse the mobile satellite services.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	3	**3**	-	-	-	1	1	-	1	-	1	1	3	1
CO2	3	2	2	3	3	3	-	-	-	-	-	1	2	-	-
CO3	3	3	3	2	-	-	-	-	-	3	-	1	1	-	1
CO4	3	3	2	-	-	-	-	-	-	-	-	1	3	3	2
CO5	3	-	-	2	-	1	-	3	-	-	-	1	3	2	-
AVG	3	2.2	**2**	1.4	0.6	0.8	0.2	0.8	-	0.8	-	1	2	1.6	0.8

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YEAR	III	SEM	5	SUBJECT CODE	EC3561
SUBJECT	VLSI Laboratory				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Write HDL code for basic as well as advanced digital integrated circuit
CO2	Import the logic modules into FPGA Boards
CO3	Synthesize Place and Route the digital IPs
CO4	Design, Simulate and Extract the layouts of Digital and Analog IC Blocks using EDA tools.
CO5	Test and verification of IC design

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	1	3	-	-	-	-	2	-	1	3	2	-
CO2	3	3	3	1	3	-	-	-	-	2	-	1	3	-	2
CO3	3	3	3	-	3	–	-	-	-	-	-	1	1	-	1
CO4	3	3	3	-	-	-	-	-	-	2	-	-	3	-	-
CO5	3	3	3	1	-	-	-	-	-	2	-	-	3	-	-
AVG	3	3	**3**	0.6	1.8	-	-	-	-	1.6	-	0.6	2.6	0.4	0.6

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YEAR	III	SEM	6	SUBJECT CODE	ET3491
SUBJECT	Embedded Systems and IOT Design				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Explain the architecture and features of 8051.
CO2	Develop a model of an embedded system.
CO3	List the concepts of real time operating systems
CO4	Learn the architecture and protocols of IoT.
CO5	Design an IoT based system for any application.

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	2	**2**	-	-	-	-	-	-	-	3	2	**1**
CO2	3	3	3	2	2	-	-	-	-	-	-	-	3	2	1
CO3	3	3	2	2	2	-	-	-	-	-	-	-	2	1	1
CO4	3	3	2	2	2	-	-	-	-	-	-	-	3	3	2
CO5	3	3	3	3	2	-	-	-	-	-	-	-	3	3	2
AVG	3	3	**2.6**	2.2	2.2	-	-	-	-	-	-	-	2.8	2.2	1.4

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YEAR	III	SEM	6	SUBJECT CODE	CS3491
SUBJECT	Artificial Intelligence and Machine Learning				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Apply appropriate search algorithms for problem solving.
CO2	Apply reasoning under uncertainty
CO3	Build supervised learning models
CO4	Build ensembling and unsupervised models
CO5	Build deep learning neural network models

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	3	-	3	-	-	-	-	3	3	3
CO2	3	3	3	3	2	3	-	3	3	-	-	-	3	3	3
CO3	3	3	3	3	2	3	2	3	2	2	-	-	3	3	3
CO4	3	3	3	3	2	3	1	3	-	3	-	-	3	3	3
CO5	3	3	3	3	2	3	2	3	-	-	-	-	3	3	3
AVG	3	3	**3**	3	2	3	1	3	1	1	-	-	3	3	3

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YEAR	III	SEM	6	SUBJECT CODE	CEC339
SUBJECT	Fundamentals of Nano Electronics				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Understand the basics of nano electronics including quantum wires, dots and wells
CO2	Use the mechanism behind quantum electronic devices
CO3	Analyze the key performance aspects of tunneling and superconducting nano electronic devices
CO4	Apply the knowledge in the development of nanotubes and nanostructure devices

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	3	-	3	-	-	-	-	3	-	3
CO2	3	2	3	3	2	3	-	3	3	-	-	-	3	3	3
CO3	3	3	3	-	2	3	1	3	2	2	-	-	3	-	3
CO4	3	3	1	3	2	-	1	3	-	3	-	-	1	3	3
CO5	3	3	3	3	2	-	1	3	-	-	-	-	3	3	3
AVG	3	2.8	2.6	2.4	2	1.8	.6	3	1	1	-	-	2.6	1.8	3

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YEAR	III	SEM	6	SUBJECT CODE	CEC348
SUBJECT	Remote Sensing				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	Discuss the principles of electromagnetic radiation.
CO2	Analyse the atmospheric radiation interactions.
CO3	Discuss the laws of planetary motion.
CO4	Discover the different types of resolution.
CO5	Discuss the concepts of digital interpretation

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	**2**	3	1	3	2	-	-	-	-	1	3	3	3
CO2	3	2	2	3	1	3	2	-	-	-	-	1	3	3	3
CO3	1	2	1	3	2	3	2	-	-	-	-	1	3	3	3
CO4	1	2	3	1	3	3	2	-	-	-	-	1	3	3	3
CO5	2	2	2	-	3	3	**2**	-	-	-	-	1	3	3	3
AVG	2.4	2	**2**	2	2	3	2					1	3	3	3

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YEAR	III	SEM	6	SUBJECT CODE	CEC365
SUBJECT	Wireless Sensor Network Design				

Students will be able to

CO	COURSE OUTCOMES STATEMENT
CO1	To be able to design solutions for WSNs applications
CO2	To be able to develop efficient MAC and Routing Protocols
CO3	To be able to design solutions for 6LOWPAN applications
CO4	To be able to develop efficient layered protocols in 6LOWPAN
CO5	To be able to use Tiny OS and Contiki OS in WSNs and 6LOWPAN applications

CO PO MAPPING

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	**3**	2	2	1	-	-	-	-	2	2	3	1	1
CO2	3	3	2	2	2	1	-	-	-	-	-	2	3	2	2
CO3	3	3	3	2	2	1	-	-	-	-	-	3	3	2	2
CO4	3	3	3	3	2	2	-	-	-	-	-	2	2	1	2
CO5	2	-	1	1	3	2	-	-	-	-	-	2	2	2	1
AVG	2.8	2.4	**2.4**	2	2.2	1.4	-	-	-	-	0.4	2.2	2.6	1.6	1.6