CO-PO-PSO MAPPING

Department of Electronics & Communication Engineering

B.Tech. ECE

GITA AUTONOMOUS COLLEGE, BHUBANESWAR

Vision of Institution

To foster prosperity through technological advancement by promoting education, innovation, and collaborative research, and to emerge as a globally renowned premier technical institution.

Mission of Institution

1. To impart high-quality professional education to students worldwide, fostering innovation, technological advancement, discipline, effective communication skills, and strong moral values.
2. To provide a broad-based education that ensures the holistic development of students.
3. To leverage expertise in science, technology, and management to deliver comprehensive training in visualizing, synthesizing, and executing projects.
4. To nurture a spirit of entrepreneurship and innovation among students.
5. To undertake sponsored research and offer consultancy services in industrial, educational, and other socially relevant domains.
6. To promote healthy practices such as community service, outreach initiatives, and innovative projects for societal benefit.

Vision of Department

To become a department of national and international repute by applying the latest evolution in the field of electronics and communication, research and development as well as imparting moral values to budding engineers, thereby laying a strong foundation for transforming the future.

Mission of Department

M1. To offer quality education so as to enable students to compete and succeed globally.
M2. To provide excellent quality of education, through which creative solutions would be demonstrated as per social requirements.
M3. To offer universal moral and value based education by promoting activities that address societal needs.
M4. To create awareness for adhering to the ethical code and knowledge creation as well as correspondence.
M5. To impart pragmatic education for becoming a centre of excellence leading to the generation and dissemination of knowledge in the field of electronics and communication.

Program Educational Objectives (PEOs)

PEO1: Our graduates will apply their knowledge and skills to succeed in an electronics and communication engineering career and/or obtain an advanced degree.

PEO2: Our graduates will apply basic principles and practices of computing grounded in mathematics and science to successfully complete hardware and/or software related engineering projects to meet customers' business objectives and/or productively engage in research.

PEO3: Our graduates will function ethically, responsively and will remain informed about all the developments of their profession.

PEO4: Our graduates will successfully function in multi-disciplinary teams.

PEO5: Our graduates will be able to perform competently in a diversified environment and individually, within a global, societal, and environmental context with ethical and moral behaviour.

Program Specific Outcomes (PSOs)

PSO1.Should be able to understand the concepts of Electronics & Communication Engineering and their semiconductor technology, consumer electronics, embedded system, communication/networking.

PSO2. Should have an ability to apply technical knowledge and usage of modern hardware & software tools related to communication engineering for solving real world problems.

PSO3. Should have the capability to analyse, comprehend, design & develop electronic subsystems / system applications and thus demonstrating professional ethics & concern for societal well-being.

Program Outcomes (POs)

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

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

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

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

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

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

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

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

GITA Autonomous College, Bhubaneswar
Department of Electronics & Communication Engineering

Semester: 1st	**Subject Name:** Engineering Mathematics I	

	Course Outcomes
CO1	Identify, formulate and solve Engineering problems.
CO2	Acquire knowledge about Advance Calculus.
CO3	Acquire knowledge about Series solution of Differential equations.
CO4	Acquire knowledge about Gamma and Beta function.
CO5	Acquire knowledge about Laplace transform and apply it to solve IVP.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	-	-	-	-	-	-	-	-	2	3	-
CO2	2	2	2	2	-	-	-	-	-	-	-	-	2	3	-
CO3	3	3	3	2	-	-	-	-	-	-	-	-	3	2	-
CO4	2	2	2	2	-	-	-	-	-	-	-	-	1	3	-
CO5	2	3	3	3	-	-	-	-	-	-	-	-	2	2	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Engineering Chemistry	

	Course Outcomes
CO1	Classify various fuels based on combustion parameters and understand the working principle of various batteries.
CO2	To understand the microstructure of a given alloy systems and eutectic systems under a given set of conditions.
CO3	Utilizetheknowledgeofelectrochemistryandcorrosionscienceinpreventingengineering equipment from corrosion.
CO4	Apply the concept of molecular spectroscopy to analyse organic compounds using spectrophotometer.
CO5	Compare and contrast the chemical behaviour and physical properties of common substance.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**-**	**-**	1	1	3	3	3	3
CO2	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**-**	**-**	1	1	3	3	2	2
CO3	**3**	**2**	**3**	**3**	**3**	**2**	**2**	-	-	1	1	3	3	2	2
CO4	**3**	**2**	**3**	**3**	**3**	**2**	**2**	-	-	1	1	3	3	1	1
CO5	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**-**	**-**	1	1	3	3	1	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Basic Electronics Engineering	

	Course Outcomes
CO1	Understand the working principles and applications of semiconductor diodes.
CO2	Analyse the operation, configurations, and biasing of BJTs.
CO3	Analyse the characteristics of FETs and feedback concepts in amplifiers and oscillators.
CO4	Understand the characteristics and applications of operational amplifiers.
CO5	Design and simplify digital circuits using Boolean algebra and logic gates.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	1	1	1	1	1	1	1	1	2	3	1	1
CO2	3	3	2	2	2	1	1	1	2	1	1	2	3	2	2
CO3	3	3	2	2	2	1	1	1	2	1	1	2	3	2	2
CO4	3	2	2	2	2	1	1	1	2	1	1	2	3	2	2
CO5	3	3	3	2	3	1	1	1	2	2	2	2	3	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Basics of Civil Engineering	

	Course Outcomes
CO1	Able to understand the basics of civil engineering and fundamental aspects of building.
CO2	Able to get the brief overview of general aspect of building material.
CO3	Able to get brief idea about transportation modes and planning.
CO4	Able to get brief idea about drinking water standards and water treatment plant.
CO5	Able to get brief idea about irrigation network system.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	1	2	-	-	-	1	2	1	1	2	-	2
CO2	3	1	1	1	3	-	-	-	1	1	1	3	2	-	3
CO3	3	2	1	1	2	-	-	-	2	2	1	2	2	-	1
CO4	3	2	2	2	2	-	-	-	1	2	1	3	2	-	2
CO5	3	2	1	2	3	-	-	-	2	2	1	3	3	-	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Communicative English	

	Course Outcomes
CO1	Use English language effectively in spoken and written forms.
CO2	Comprehend the given texts and respond appropriately.
CO3	Communicate confidently in various contexts and different cultural scenarios.
CO4	Acquire proficiency in English including reading and listening comprehension, writing and speaking skills.
CO5	Understand the nuances of spoken English and be effective speakers.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	3	2	3	3	2	1	3	3	3	-
CO2	2	2	3	3	3	2	2	3	3	2	2	3	3	3	-
CO3	2	2	3	2	3	2	1	2	2	2	2	3	3	2	-
CO4	2	1	3	2	3	1	1	2	2	1	2	2	3	2	-
CO5	1	0	2	1	2	1	1	2	2	2	1	2	2	2	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Engineering Chemistry Lab	

	Course Outcomes
CO1	Learn and apply basic techniques used in chemistry laboratory for small/large scale water analyses/purification.
CO2	Be able to estimate the ions/metal ions present in domestic/industry waste water.
CO3	Utilize the fundamental laboratory techniques for analyses such as titrations, separation /purification and spectroscopy.
CO4	Test the quality of an oil/fat by measuring its iodine or acid value by means of amount of unsaturation for various industrial use.
CO5	Verify quality of a lubricant by means of its viscosity or flash point which gives their nature & flammability for various industrial applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	3	3	1	-	-	2	1	-	1	3	3	3
CO2	3	3	2	3	2	1	-	-	1	1	-	1	3	3	3
CO3	3	2	1	3	3	1	-	-	1	1		1	3	3	3
CO4	3	3	3	2	3	2	1	1	2	2	1	2	2	3	3
CO5	1	1	1	1	1	1	1	1	3	3	1	2	2	2	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Basic Electronics Engineering Lab	

	Course Outcomes
CO1	Acquire knowledge of various electronic components, measuring instruments.
CO2	Analyse circuit waveforms using an oscilloscope and function generator.
CO3	Implementation of Diode in various applications Rectifier, Clipper, Clamper.
CO4	Acquire knowledge of characteristics of transistors and various applications using Op-Amp.
CO5	Design digital circuits for various applications using logic gates.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	3	-	-	-	1	1	-	2	3	2	2
CO2	3	3	2	3	3	-	-	-	1	1	-	2	3	2	3
CO3	3	3	3	2	2	-	-	-	1	1	-	3	3	3	3
CO4	3	2	3	3	3	-	-	-	1	1	-	3	3	3	3
CO5	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Basics of Civil Engineering Lab	

	Course Outcomes
CO1	Perform Material Testing and Analysis.
CO2	Evaluate Cement and Concrete Properties.
CO3	Analyse Mechanical Properties of Reinforcement.
CO4	Apply Surveying Techniques for Linear and Angular Measurement.
CO5	Demonstrate Competence in Advanced Surveying Instruments.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	2	1	2	3	-	-	1	-	-	2	2	-	1
CO2	3	1	2	1	2	3	-	-	1	1	-	1	2	-	1
CO3	3	1	2	1	2	3	-	-	1	-	-	2	3	-	1
CO4	3	2	2	1	2	3	-	-	1	1	-	2	2	-	2
CO5	3	1	3	1	2	3	-	-	1	-	-	2	2	-	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** Engineering Graphics & Design Lab	

	Course Outcomes
CO1	Prepare and understand drawings.
CO2	Use the principles of orthographic projections.
CO3	By studying about projections of solids students will be able to visualize three dimensional objects and that will enable them to design new products.
CO4	Design and fabricate surfaces of different shapes.
CO5	Represent the objects in three dimensional appearances.

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Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	2	1	2	3	-	-	1	-	-	2	2	-	1
CO2	3	1	2	1	2	3	-	-	1	1	-	1	2	-	1
CO3	3	1	2	1	1	3	-	-	1	-	-	2	3	-	1
CO4	3	2	2	1	1	3	-	-	1	1	-	2	2	-	2
CO5	3	1	3	1	1	3	-	-	1	-	-	2	2	-	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 1st	**Subject Name:** English Language Lab	

	Course Outcomes
CO1	Learn the nuances of effective business communication, to improve their thought process and enable them to think critically by making them go through presentations on business topics.
CO2	Read and understand the meaning of a given business text drawn from and original source and be able to write answers based on the same passage.
CO3	Participate in mock interviews and learn the nuances of doing company research in order to prepare for the real PI.
CO4	Practice the etiquette of a group discussion through practice sessions.
CO5	Imbibe the knowledge of effective speaking and presentation required for various business contexts, using power point presentations.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	-	3	3	3	3	-	-	3	2	3
CO2	3	3	3	3	3	-	2	3	3	3	-	-	3	2	2
CO3	3	2	3	3	3	-	2	3	3	2	-	-	3	1	2
CO4	2	1	2	2	3	-	1	2	2	2	-	-	3	-	2
CO5	1	1	2	1	3	-	1	1	1	1	-	-	2	-	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	**Subject Name:** Engineering Mathematics-II	

	Course Outcomes
CO1	Apply the knowledge of Mathematics in Physical sciences and Engineering.
CO2	Acquire knowledge of Double and Triple Integral and their applications in engineering subjects.
CO3	Acquire knowledge about Fourier series and Fourier transform.
CO4	Apply Knowledge vector calculus in engineering and physical sciences.
CO5	Acquire knowledge of Matrix Algebra, Determinants and their applications in engineering subjects.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	-	-	-	-	-	-	-	-	3	2	-
CO2	2	2	2	2	-	-	-	-	-	-	-	-	1	1	-
CO3	2	2	2	2	-	-	-	-	-	-	-	-	1	1	-
CO4	2	2	2	2	-	-	-	-	-	-	-	-	1	1	-
CO5	3	3	3	2	-	-	-	-	-	-	-	-	3	2	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	**Subject Name:** Engineering Mechanics	

	Course Outcomes
CO1	Understand force systems and equilibrium.
CO2	Understand the details of structures and moments.
CO3	Understand kinematics and dynamics of particles and rigid bodies.
CO4	Interpret and analyse results from engineering mechanics calculations.
CO5	Analyse safety factors and design constraints when applying mechanics principles.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	2	2	2	3	3	2	3	3	3	2	3
CO2	3	3	2	2	2	1	1	2	3	2	2	2	3	1	2
CO3	3	2	2	1	1	1	1	2	3	2	2	2	3	1	2
CO4	3	1	2	1	1	1	1	2	3	2	2	2	3	1	2
CO5	3	1	2	1	-	-	-	1	2	1	1	1	2	-	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	Subject Name: Engineering Physics	

	Course Outcomes
CO1	Learn vibrations and oscillatory systems. It helps in understanding multiple oscillatory systems and complex oscillations. It adds in developing ideas of wave propagation and superposition principle.
CO2	Know the benefits the understanding of light and its wave nature in different experimental demonstration of interference. Diffraction in solids will help in dealing with XRD and structure of materials.
CO3	Makea clarity of making out crystal structures and crystallography to learn about different materials and characteristics of solids.
CO4	Different LASERS like Ruby, He-Ne and S.C. Lasers will help to develop multiple ideas of its application. Principle of optical fibres will help to know new generation optical fibres in communication systems.
CO5	Gain some fundamental knowledge about electromagnetism. It will familiarize with some basic used in vector calculus prior to development of Maxwell's electromagnetic wave equations & quantum mechanics.

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Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	3	1	2	-	-	-	-	1	2	2	3
CO2	3	2	1	3	2	2	2	-	-	-	-	2	3	3	2
CO3	2	2	2	2	3	1	1	-	-	-	-	1	2	2	2
CO4	3	2	1	2	1	2	1	-	-	-	-	2	2	2	2
CO5	2	1	2	2	2	1	1	-	-	-	-	3	2	2	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 2nd	**Subject Name:** Basic Electrical Engineering	

	Course Outcomes
CO1	Impart basic knowledge of electrical quantities and provide working knowledge for the analysis of DC circuits.
CO2	Derive expressions for impedance, current, power in series and parallel RLC circuit with single phase AC supply along with phasor diagram.
CO3	Relate the phase and line electrical quantities in polyphase networks.
CO4	Learn about magnetism and the basic working principle of static electromagnetic conversion device such as transformers.
CO5	Comprehend the working principles of electrical DC and AC machines.

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Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	1	3	2	3	-	-	-	-	-	-	1	3	2	-
CO2	3	2	1	3	2	-	-	-	-	-	-	2	3	3	-
CO3	2	1	3	2	3	-	-	-	-	-	-	1	3	2	-
CO4	3	2	1	2	3	-	-	-	-	-	-	2	3	3	-
CO5	2	1	2	2	3	-	-	-	-	-	-	1	2	2	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	**Subject Name:** Basics of Mechanical Engineering	

	Course Outcomes
CO1	Understand fundamentals statics, friction, truss, CG and MI.
CO2	Understand principle of dynamics, work, energy, impact, rotational and curvilinear motion.
CO3	Understand application of Thermodynamics: I.C. Engines, Refrigerators and Steam Generators- Steam Power Plant, Steam Turbine.
CO4	Understand the application of Screw Threads, Nuts, Bolts & Rivets, Clutch and Gear Box and Braking System.
CO5	Understand Foundry Practices- Pattern, Mould & Casting, Mechanical working of metals - Sheet metal works.

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Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	3	-	-	-	-	-	-	3	3	3	3
CO2	2	3	3	2	3	-	-	-	-	-	-	3	3	3	2
CO3	2	3	3	2	3	-	-	-	-	-	-	3	3	3	2
CO4	2	2	3	2	3	-	-	-	-	-	-	3	3	2	2
CO5	2	2	2	2	2	-	-	-	-	-	-	3	2	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	Subject Name: Business Communication and Life Skills	

	Course Outcomes
CO1	Learn the nuances of effective business communication, to improve their thought process and enable them to think critically by making them go through presentations on business topics.
CO2	Read and understand the meaning of a given business text drawn from and original source and be able to write answers based on the same passage.
CO3	Participate in mock interviews and learn the nuances of doing company research in order to prepare for the real PI.
CO4	Practice the etiquette of a group discussion through practice sessions.
CO5	Imbibe the knowledge of effective speaking and presentation required for various business contexts, using power point presentations.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	-	-	-	-	-	-	2	2	3	2
CO2	3	3	3	3	3	-	-	-	-	-	-	1	1	2	1
CO3	3	3	3	3	3	-	-	-	-	-	-	1	1	2	1
CO4	3	3	2	3	2	-	-	-	-	-	-	1	1	1	1
CO5	3	3	2	2	2	-	-	-	-	-	-	-	1	1	1

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 2nd	Subject Name: Programming for Problem Solving using C	

	Course Outcomes
CO1	Design simple algorithms for arithmetic and logical problem.
CO2	Implement the algorithms to C programs using various control structure.
CO3	Test and execute programs using function, array and string manipulation.
CO4	Apply memory allocation using pointers and structures for dynamic data structures.
CO5	Handle data storage in disk using file and storage class specifiers.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	PO1	PO2	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	-	-	-	-	-	-	3	3	2
CO2	3	3	3	3	3	1	-	-	-	-	-	-	2	3	2
CO3	2	3	2	3	3	1	-	-	-	-	-	-	2	2	1
CO4	1	3	1	3	2	1	-	-	-	-	-	-	1	2	1
CO5	1	3	1	3	1	-	-	-	-	-	-	-	1	1	1

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 2nd	Subject Name: Engineering Physics Lab	

	Course Outcomes
CO1	Know the accuracy and precision in measurement
CO2	know how to calculate Young's modulus, rigidity modulus of a wire and too understand the concept of vibration mechanism.
CO3	Determine the surface tension of liquid and to understand fluid properties.
CO4	To experiment with wave nature of light in diffraction through a grating and Newton's rings.
CO5	To know the variation of I ~V of PN junction and BJT.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	PO1	PO2	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	1	1	-	-	-	-	-	-	3	3	2
CO2	1	1	1	2	1	1	-	-	-	-	-	-	2	2	1
CO3	2	2	2	2	1	0	-	-	-	-	-	-	2	2	1
CO4	1	1	1	2	1	1	-	-	-	-	-	-	1	1	0
CO5	3	3	2	2	0	0	-	-	-	-	-	-	1	1	0

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 2nd	Subject Name: Basic Electrical Engineering Lab	

	Course Outcomes
CO1	Verify fundamental electrical theorems (Norton's, Thevenin's, and Superposition theorems) and analyse electrical circuits to solve practical problems.
CO2	Analyse the V-I characteristics of incandescent lamps, time-fusing current characteristics of fuses, and power measurements in three-phase systems using the two-wattmeter method.
CO3	Assemble, test, and measure the performance of electrical devices such as fluorescent lamps, single-phase energy meters, and transformers under no-load conditions.
CO4	Analyse series R-L-C circuits excited by AC supply to determine current, voltage, power, and power factor, and evaluate the results experimentally.
CO5	Demonstrate knowledge of house wiring, electrical safety rules, and grounding techniques, including the measurement of earth resistance using a megger.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2	2	2	-	3	2	-	2	3	3	2
CO2	3	2	2	2	2	2	2	-	3	2	-	2	3	2	2
CO3	2	1	1	1	2	1	1	-	3	2	-	1	3	2	1
CO4	1	1	1	1	1	1	1	-	2	1	-	1	3	2	1
CO5	1	1	1	1	1	1	1	-	2	1	-	1	3	2	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	Subject Name: Basics of Mechanical Engineering Lab	

	Course Outcomes
CO1	Understand different components and its function of an automobile.
CO2	Understand different types of boilers and its construction.
CO3	Understand the principle of vapour compression refrigeration system.
CO4	Understand the different types of hydraulic turbine and pump and its construction.
CO5	Understand principle and working of different types of gear, clutch.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	2	2	2	-	-	-	3	3	2	-	3	2	-
CO2	2	2	2	2	2	-	-	-	3	3	2	-	3	2	-
CO3	2	1	2	1	1	-	-	-	3	3	2	-	2	2	-
CO4	1	1	1	1	1	-	-	-	3	2	1	-	2	1	-
CO5	1	1	1	1	1	-	-	-	2	2	1	-	2	1	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	**Subject Name:** Workshop Practice	

	Course Outcomes
CO1	Use various fitting tools and able to perform fitting operation.
CO2	Understand principle of gas welding and able to perform gas welding operation.
CO3	Understand principle of arc welding and able to perform arc welding operation.
CO4	Understand different parts of a lathe and able to perform turning, facing, threading, tapering using lathe.
CO5	Understand different parts of a shaping and milling machine and able to perform shaping and milling operation.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	3	2	3	2	2	-	3	3	-	3	3	2	3
CO2	2	2	3	2	2	2	2	-	3	3	-	3	3	2	3
CO3	2	2	2	1	2	2	1	-	3	3	-	3	2	2	3
CO4	2	2	3	2	2	1	2	-	3	2	-	2	2	1	3
CO5	2	1	2	1	3	1	1	-	2	2	-	2	2	1	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 2nd	Subject Name: Programming for Problem Solving using C Lab	

	Course Outcomes
CO1	Design algorithms using pseudocode and flowcharts to represent the logical sequence of operations.
CO2	Comprehend basic C syntax, data types (integers, floats, characters), variables, operators, and input/output operations.
CO3	Create and utilize user-defined functions to modularize code, improving readability and reusability.
CO4	Perform operations like searching, sorting, and manipulation on arrays.
CO5	Understand the concept of pointers, their usage to access memory directly and manipulate data efficiently.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	-	-	2	-	-	-	-	-	2	3	2	1
CO2	2	3	3	-	-	2	-	-	-	-	-	1	3	1	-
CO3	2	3	3	-	-	1	-	-	-	-	-	1	2	1	-
CO4	2	3	3	-	-	1	-	-	-	-	-	1	2	1	-
CO5	1	3	2	-	-	-	-	-	-	-	-	-	1	1	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Engineering Mathematics-III	

	Course Outcomes
CO1	Understand briefly how to get approximation solution of the problems related to engineering, where we don't have adequate information about analytic solution and classical solution.
CO2	Know about interpolation. Enhance this idea towards numerical integration.
CO3	Solve Initial value Problem and Boundary value problem using single step and multistep method.
CO4	Acquire knowledge about algebra of probability, random variable, probability distributions, Expectation, variance and standard deviation.
CO5	Acquire knowledge about point estimation, interval of estimation, testing hypothesis, regression analysis and statistical quality control.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	-	-	-	-	-	-	-	-	2	2	-
CO2	2	2	2	2	-	-	-	-	-	-	-	-	1	2	-
CO3	2	2	2	2	-	-	-	-	-	-	-	-	2	2	-
CO4	3	3	2	2	-	-	-	-	-	-	-	-	2	2	-
CO5	2	2	2	2	-	-	-	-	-	-	-	-	2	2	-

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 3rd	**Subject Name:** Data Structure using C	

	Course Outcomes
CO1	Analyse performance of algorithms and implement various operations on array and sparse matrix.
CO2	Apply the basic operations of stacks and queues to solve real world problems
CO3	Implement different types of linked list operations and their applications
CO4	Represent data using trees & graphs to use them in various rea life applications.
CO5	Analyse various sorting algorithms and explore different hashing techniques

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	3	-	-	-	2	2	-	2	3	3	2
CO2	3	3	3	2	3	-	-	-	2	2	-	2	3	3	2
CO3	3	3	3	2	3	-	-	-	2	2	-	2	3	3	3
CO4	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	2	3	-	-	-	2	2	-	3	3	3	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Organizational Behaviour	

	Course Outcomes
CO1	Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.
CO2	Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
CO3	Analyze the complexities associated with management of the group behavior in the organization.
CO4	Demonstrate how the organizational behavior can integrate in understanding the motivation behind behavior of people in the organization.
CO5	Analyse the various stressors and identifying the various ways to manage it.
CO6	Assessing various ways and methods for adopting to the organizational policies and strategies.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	-	-	-	-	-	-	2	1	2	2	2	1	-	-	1
CO2	-	-	-	-	-	-	2	2	2	1	1	1	-	-	1
CO3	-	-	-	-	-	-	1	2	1	2	1	2	-	-	1
CO4	-	-	-	-	-	-	1	2	1	1	1	2	-	-	1
CO5	-	-	-	-	-	-	2	1	1	1	1	2	-	-	1
CO5	-	-	-	-	-	-	1	1	1	1	1	1	-	-	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Analog Electronics Circuit	

	Course Outcomes
CO1	Understand the importance of BJT biasing for stable circuit operation and learn methods to ensure bias stability.
CO2	Gain detailed knowledge of the construction, working principles, applications of different types of Field Effect Transistors (JFET and MOSFET) and students will gain foundational knowledge of CMOS technology and its role in the design of low-power, high-speed integrated circuits.
CO3	Gain detailed knowledge of small signal models for BJTs and JFETs, enabling them to analyse, design efficient amplifier circuits and students will analyse the impact of load resistance (RL) and source resistance (RS) on amplifier performance, including gain and frequency response.
CO4	Learn the ideal characteristics of operational amplifiers and compare them with practical op-amp behaviour for various applications and design and analyse differential and instrumentation amplifiers for high-precision measurement systems.
CO5	Understand the operation and design principles of crystal oscillators, appreciating their high-frequency stability in communication systems and enhance their problem-solving abilities by analysing circuit stability and performance issues in feedback and oscillator circuits.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	1	-	-	-	1	1	2	2	3	2	3
CO2	3	3	2	2	3	-	-	-	-	1	1	3	3	3	3
CO3	3	3	3	3	2	-	-	-	-	1	2	2	3	3	3
CO4	3	3	3	3	2	-	-	1	1	2	2	3	3	2	3
CO5	3	3	3	3	2	-	-	1	1	2	3	3	3	2	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Digital System Design	

	Course Outcomes
CO1	Understand fundamental digital concepts, logic gates, number systems, and logic families.
CO2	Analyse and simplify combinational logic circuits using Boolean algebra, K-maps, and logic components
CO3	Design sequential logic circuits using flip-flops, FSMs, shift registers, and counters.
CO4	Explore programmable logic devices, semiconductor memories, and their applications.
CO5	Develop and implement digital circuits using VHDL with different modelling styles.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	-	-	-	1	1	-	2	3	2	2
CO2	3	3	3	2	3	-	-	-	1	2	-	2	3	2	2
CO3	3	3	3	3	3	-	-	-	1	1	-	3	3	3	3
CO4	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Universal Human Values	

	Course Outcomes
CO1	Aware of themselves, and their surroundings (family, society, nature).
CO2	Become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO3	Have better critical and analytical ability and sense of living in harmony.
CO4	Become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO5	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	1	1	1	3	3	2	2	2	1	3	2	1	2
CO2	2	3	2	2	1	3	3	3	2	2	2	3	2	2	3
CO3	2	3	2	3	2	3	3	3	2	3	2	3	2	3	3
CO4	1	2	2	2	2	3	3	3	3	3	2	3	2	2	3
CO5	3	2	2	3	2	3	3	2	3	3	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Environmental Science	

	Course Outcomes
CO1	Integrate ecological knowledge with modern electronics and communication engineering, promoting sustainability, energy efficiency, and responsible innovation.
CO2	Integrate atmospheric, soil, and noise pollution knowledge into electronics and communication engineering, fostering eco-friendly innovations, sustainable design practices, and resilient electronic systems.
CO3	Integrate water and wastewater treatment knowledge with electronics and communication engineering, fostering sustainable industrial practices, smart water management, and eco-friendly innovation in ECE applications.
CO4	Integrate waste management knowledge with electronics and communication engineering, fostering sustainable design practices, e-waste management solutions, and ethical engineering practices that reduce environmental impact.
CO5	Understand the importance of environmental impact assessment (EIA), environmental impact statements (EIS), and environmental laws in the context of electronics and communication engineering, promoting sustainable engineering practices, legal compliance, and ethical responsibility in technology development.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	3	2	1	1	3	3	1	2	2	2	2	3	3
CO2	2	2	3	2	1	1	3	3	2	2	2	2	3	3	3
CO3	2	2	3	2	1	1	3	3	1	2	2	2	2	3	3
CO4	2	2	3	2	1	1	3	3	2	2	2	2	3	3	3
CO5	2	2	3	2	1	1	3	3	2	2	3	3	2	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Analog Electronics Circuit Lab	

	Course Outcomes
CO1	Design, assemble and test BJT biasing circuits.
CO2	Analyse the Dc and Ac performance of BJT and FET.
CO3	Understand the frequency response of single & multi-stage BJT and compare the results.
CO4	Study operational amplifier and its various applications.
CO5	Analyse and design various wave shaping circuits.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	2	1	1	-	-	2	2	1	3	2	2
CO2	3	3	2	3	2	1	1	-	1	1	2	1	3	2	2
CO3	3	3	2	3	3	1	2	-	1	1	2	2	3	2	2
CO4	3	3	3	3	3	1	2	-	-	2	1	2	3	1	1
CO5	3	2	2	3	2	1	1	-	-	1	1	1	3	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Digital System Design Lab	

	Course Outcomes
CO1	Test and implement basic logic gates, universal gates, and combinational circuits.
CO2	Design, simulate, and test multiplexers, de-multiplexers, and code converters.
CO3	Construct and investigate the operation of flip-flops, counters, and shift registers.
CO4	Develop and test arithmetic circuits, including adders, subtractors, and multipliers.
CO5	Simulate and implement digital circuits using VHDL for real-time applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	-	-	-	1	1	-	2	3	2	2
CO2	3	3	3	2	3	-	-	-	1	1	-	2	3	2	2
CO3	3	3	3	3	3	-	-	-	1	1	-	3	3	3	3
CO4	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Data Structure using C Lab	

	Course Outcomes
CO1	Implement array operations to solve problems
CO2	Understand stack operations using programming
CO3	Implement of queue and its operations
CO4	Apply liked list to solve problems
CO5	Apply tree and graph concept to design the model

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	3	-	-	-	1	1	-	2	3	3	2
CO2	3	3	2	2	3	-	-	-	1	1	-	2	3	3	2
CO3	3	3	2	2	3	-	-	-	1	1	-	2	3	3	3
CO4	3	3	3	2	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 3rd	**Subject Name:** Employability Skill-I	

	Course Outcomes
CO1	Demonstrate proficiency in grammar and usage.
CO2	Differentiate between various types of Verbs And their functions.
CO3	Enhance reading and comprehension skills.
CO4	Improve writing skills.
CO5	Strengthen sentence construction and voice modulation.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	3	-	-	-	-	-	-	1	3	-	-
CO2	3	3	2	2	2	-	-	-	-	-	-	1	2	-	-
CO3	3	3	1	2	2	-	-	-	-	-	-	1	2	-	-
CO4	3	3	1	1	1	-	-	-	-	-	-	-	2	-	-
CO5	3	2	1	1	1	-	-	-	-	-	-	-	2	-	-

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Electromagnetic Theory	

	Course Outcomes
CO1	Explain various coordinate system, electrostatic fields and magneto static fields.
CO2	Describe time-varying fields and Maxwell's equations on electromagnetics.
CO3	Understand about what is field and visualize the way they vary.
CO4	Explain electromagnetic wave propagation through dielectrics, space, and conductors.
CO5	Analyse the behaviour of transmission line and explain their applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	1	2	-	-	-	3	1	-	2	2	2	1
CO2	3	3	2	3	2	-	-	1	-	2	1	2	3	2	2
CO3	3	2	2	2	2	1	1	-	1	2	-	3	2	3	1
CO4	3	2	3	2	3	1	2	-	1	1	1	3	3	2	2
CO5	3	3	3	2	3	-	2	1	2	3	2	3	2.5	1	3

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 4th	Subject Name: Engineering Economics and Costing	

	Course Outcomes
CO1	Evaluate the economic theories, cost concepts and pricing policies.
CO2	Understand the measures of national income, the functions of banks and concepts of globalization.
CO3	Apply the concepts of financial management for project appraisal.
CO4	Understand accounting systems and analyse financial statements using ratio analysis.
CO5	Understand the impact of inflation, taxation, depreciation. Financial planning, economic basis for replacement, project scheduling, and legal and regulatory issues are introduced and applied to economic investment and project-management problems.
CO6	Determine the accurate project cost estimates and plan future activities.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	-	-	-	-	-	-	2	1	2	2	2	1	-	-	1
CO2	-	-	-	-	-	-	2	2	2	1	1	1	-	-	1
CO3	-	-	-	-	-	-	1	2	1	2	1	2	-	-	1
CO4	-	-	-	-	-	-	1	2	1	1	1	2	-	-	1
CO5	-	-	-	-	-	-	2	1	1	1	1	2	-	-	1
CO6	-	-	-	-	-	-	1	1	1	1	1	1	-	-	1

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 4th	**Subject Name:** Microprocessor and Microcontroller	

	Course Outcomes
CO1	Understand details of Intel 8085 microprocessors like bus and register organizations, Instructions with programming, memory interfacing, timing diagram and interrupt.
CO2	Understand details of Intel 8086 microprocessors like segment memory, bus and register organizations, memory interfacing, timing diagram and interrupt, different modes of operation.
CO3	Apply knowledge of Intel 8086 Instruction set for programming the microprocessor.
CO4	Analyse different functions of the 8051 microcontrollers like memory interfacing and interrupt, timer and serial programming.
CO5	Create solutions for real life applications by interfacing of peripherals like Intel 8259, Intel 8237, Intel 8251, Intel 8254 with the microprocessor and microcontrollers.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	3	-	-	-	-	-	-	2	3	3	2
CO2	3	3	2	2	3	-	-	-	-	-	-	2	3	3	2
CO3	3	3	3	2	3	-	-	-	-	-	-	2	3	3	2
CO4	3	3	2	2	3	-	-	-	-	-	-	2	3	3	3
CO5	3	3	3	3	3	2	1	2	2	2	2	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Digital Signal Processing	

	Course Outcomes
CO1	Explain the stability and causality of the LTI systems using Z-Transform.
CO2	Analyse discrete signals & systems using DFT technique.
CO3	Realize different structures of FIR and IIR discrete time systems.
CO4	Design IIR and FIR filters using various techniques.
CO5	Implementing some real time signal processing application using MATLAB.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	2	1	1	1	1	1	3	3	2	2
CO2	3	3	2	3	3	2	1	1	1	1	1	3	3	3	2
CO3	2	2	3	1	1	2	2	2	3	3	3	2	2	1	2
CO4	3	3	3	3	3	3	2	2	2	1	1	3	3	3	2
CO5	3	3	2	2	3	3	3	2	1	1	1	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Introduction to Machine Learning	

	Course Outcomes
CO1	Learn statistical and machine learning skills applicable in signal processing, automation, and predictive analytics in electronics engineering.
CO2	Apply advanced machine learning techniques in signal processing, embedded systems, automation, and predictive modelling within electronics engineering.
CO3	Apply machine learning models in pattern recognition, automation, and intelligent systems within electronics engineering.
CO4	Advanced data analysis skills crucial for AI-driven electronics, automation, and intelligent systems.
CO5	Integrate AI-driven learning models into real-world electronics and automation systems.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	1	3	3	2	1	2	2	1	3	3	3	3
CO2	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
CO4	3	3	3	3	3	3	2	1	2	2	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** OOPs using JAVA	

	Course Outcomes
CO1	Apply object-oriented programming principles using Java, effectively utilizing UML diagrams for system modelling and implementing key concepts such as classes, objects, methods, constructors, and control structures.
CO2	Demonstrate a clear understanding of object-oriented programming concepts such as inheritance, method overriding, and interfaces, while effectively implementing exception handling techniques to develop robust and maintainable Java applications.
CO3	Demonstrate proficiency in handling file input/output operations, implement multithreading concepts using the Thread class and runnable interface, and apply synchronization techniques for effective inter-thread communication in concurrent programming.
CO4	Demonstrate proficiency in string manipulation techniques, effectively utilize different string handling classes, understand the lifecycle of applets, and implement event handling using the delegation event model and adapter classes in Java applications.
CO5	Design and develop graphical user interfaces (GUIs) using AWT, Swing, and JavaFX, integrating event-driven programming and database connectivity through JDBC to create dynamic, interactive applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	1	1	1	2	2	2	3	3	2	2
CO2	3	3	2	2	3	1	1	2	2	2	2	3	3	3	2
CO3	3	3	2	3	3	1	1	2	2	2	2	3	3	3	3
CO4	2	2	2	2	3	1	1	2	2	3	2	3	3	2	2
CO5	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Constitution of India	

	Course Outcomes
CO1	Explain the historical background and salient features of the Indian Constitution, including the Preamble, Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy, and analyse their legal status and implementation.
CO2	Describe the federal structure of India, the distribution of legislative and financial powers between the Union and the States, and the composition, powers, and functions of the Union Legislature (Parliament) and the Union Executive (President, Vice-President, Council of Ministers, and Prime Minister.
CO3	Analyse the structure, powers, and functions of the State Government, including the State Legislature and State Executive (Governor), and evaluate their roles in the Indian political system.
CO4	Explain the amendment process of the Indian Constitution, the emergency provisions (National Emergency, President's Rule, Financial Emergency), and the scope of Fundamental Rights (Equality, Freedom under Article 19, and Right to Life and Personal Liberty under Article 21). They will also evaluate the constitutional scheme of Local Self-Government in India.
CO5	Analyse the structure, jurisdiction, and functions of the Indian Judicial System, including the Supreme Court and High Courts. They will also evaluate the concepts of judicial review, judicial activism, and the independence of the judiciary in India.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	2	2	2	3	1	3	2	2	2	3	2	2	2
CO2	2	3	2	2	2	3	1	3	2	2	2	3	2	2	2
CO3	2	3	2	2	2	3	1	3	2	2	2	3	2	2	2
CO4	2	3	2	2	2	3	1	3	2	2	2	3	2	2	2
CO5	2	3	2	2	2	3	1	3	2	2	2	3	2	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Microprocessor and Microcontroller Lab	

	Course Outcomes
CO1	Understand the concept of assembly language programming using Microprocessor and Microcontroller trainer kits.
CO2	Develop and apply assembly language programs using loop, branch, arithmetic, logical, shift,rotate, array & string operations using 8086.
CO3	Develop and implement assembly language programs like finding largest/smallest numbers, check existence of data, etc.
CO4	Develop and implement assembly language programs like finding even/ odd and positive/ negative number numbers.
CO5	Develop and implement assembly language programs for interfacing peripheral like 8255, and D/A converter, stepper motor controller, and keyboard with display interface using 8279.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	-	2	-	-	-	-	-	-	2	3	2	2
CO2	3	3	3	2	3	-	-	-	-	-	-	2	3	3	2
CO3	3	3	3	2	3	-	-	-	-	-	-	2	3	3	2
CO4	3	3	2	2	3	-	-	-	-	-	-	2	3	3	2
CO5	3	3	3	3	3	2	-	-	2	2	2	3	3	3	3

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 4th	**Subject Name:** Digital Signal Processing Lab	

	Course Outcomes
CO1	Explain the generation of various elementary signals in MATLAB.
CO2	Analyse basic signal processing operations like convolution, correlation etc.
CO3	Analyse the spectrum of discrete time signals using DFT.
CO4	Implement various efficient computation technique using DITFFT and DIFFFT algorithm.
CO5	Design FIR and IIR filters using various techniques.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	3	3	1	1	1	3	1	1	3	3	2
CO2	3	3	2	2	3	2	1	1	1	2	1	2	3	3	2
CO3	3	3	3	2	3	2	1	1	1	2	1	2	3	3	2
CO4	3	3	3	2	3	3	1	1	1	2	1	2	3	3	3
CO5	3	3	3	3	3	2	1	1	1	2	1	2	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 4th	**Subject Name:** Mini Project-I	

	Course Outcomes
CO1	Demonstrate the ability to identify real-world problems and analyse requirements for developing a suitable solution.
CO2	Apply fundamental concepts of programming, circuit design, or embedded systems to implement an efficient and optimized solution.
CO3	Design, develop, and test a prototype/model using appropriate tools, techniques, and technologies.
CO4	Evaluate system performance using metrics such as speed, accuracy, efficiency, and propose improvements where necessary.
CO5	Effectively communicate the project's objectives, methodology, results, and findings through well-structured reports and presentations.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	1	2	1	1	2	2	2	3	3	2	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	3	3	2	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	3	1	1	1	1	1	1	1	3	3	3	3	2	3	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 4th	**Subject Name:** Employability Skill-II	

	Course Outcomes
CO1	Develop placement enabled programming skill according to industry pattern.
CO2	Develop quantitative and reasoning skill for recruitment.
CO3	Develop coding skill for campus recruitment.
CO4	Develop techniques to solve Q and LR problems with in stipulated time.
CO5	Develop logical reasoning skills.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	2	2	3	3	3	3	-	3	3	3	3
CO2	3	3	3	3	1	1	3	2	2	3	-	3	3	3	3
CO3	3	2	2	2	1	1	3	2	2	3	-	2	3	3	3
CO4	2	2	2	1	1	1	2	2	2	1	-	2	2	3	3
CO5	2	1	1	1	-	-	1	1	2	1	-	1	2	2	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Digital VLSI	

	Course Outcomes
CO1	Understand different VLSI design styles (full-custom, semi-custom, and programmable logic) and their trade-offs in real-world applications. Students will comprehend the importance of hierarchy in VLSI design, helping them structure large-scale digital designs effectively.
CO2	Learn how to analyse, interpret the current-voltage characteristics of MOSFETs and will understand the challenges, techniques related to MOSFET scaling, including small-geometry effects in modern transistor design and apply this knowledge to circuit design and performance evaluation.
CO3	Develop a deep understanding of MOS inverter circuits, including their design, operation, and significance in digital logic design.
CO4	Develop a comprehensive understanding of design principles for high-speed CMOS logic circuits.
CO5	Gain knowledge of pass transistor logic, CMOS transmission gate logic, design of memory cells, fault types and fault models which enable them to design efficient logic circuits.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3	2	3	-	2	2	1	2	2	2	2	2	2
CO2	3	3	2	3	2	-	-	1	1	1	1	2	2	2	3
CO3	3	3	3	2	2	1	-	1	1	1	1	2	1	3	2
CO4	3	3	3	3	3	-	1	1	1	2	2	2	2	2	3
CO5	3	3	3	2	3	1	-	2	1	2	2	2	3	3	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Control System Engineering	

	Course Outcomes
CO1	Understand and apply basic concepts of control system to develop mathematical model of various physical systems in engineering and also study effect of feedback on system characteristics.
CO2	Use standard test signals to determine performance characteristics of first and second-order systems and determine the stability using time domain techniques.
CO3	Identify the methods of frequency domain analysis and apply it to determine different types of stability in frequency domain.
CO4	Differentiate between Transfer Function and State-Space approach of describing a system and understand the design of conventional controllers used in industry.
CO5	Understand different types of control components and its design for reliable and efficient application in industry.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	2	-	-	-	-	2	-	-	3	2	3
CO2	2	3	2	2	2	1	-	-	-	2	-	-	3	2	3
CO3	2	2	3	2	1	-	-	-	-	1	-	-	2	1	2
CO4	1	2	2	2	3	-	-	-	-	2	-	-	2	1	2
CO5	1	2	1	2	3	-	-	-	-	1	-	-	2	1	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Analog and Digital Communication	

	Course Outcomes
CO1	Perform spectral analysis, and apply modulation techniques in modern communication systems.
CO2	Develop a strong foundation in noise analysis, modulation techniques, and signal quality improvement in communication systems.
CO3	Gain theoretical understanding, practical implementation skills, and noise analysis techniques for modern digital communication systems.
CO4	Develop a deep understanding of detection theory, modulation techniques, error analysis, and their applications in real-world digital communication systems.
CO5	Gain a comprehensive understanding of digital modulation, demodulation, equalization, and synchronization techniques for efficient and reliable communication in modern digital systems.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	3	3	2	1	1	1	2	1	3	3	3	2
CO2	3	3	2	3	3	2	1	1	1	2	2	3	3	3	3
CO3	3	3	3	3	3	3	1	2	1	2	2	3	3	3	3
CO4	3	3	3	3	3	3	2	2	2	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	1	2	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Wireless Communication	

	Course Outcomes
CO1	Understand functioning of wireless communication system and evolution of different wireless communication systems and standards.
CO2	Analyse the architecture, functioning, protocols, capabilities and application of various wireless communication networks.
CO3	Compare different technologies used for wireless communication systems.
CO4	Evaluate design challenges, constraints and security issues associated with Ad-hoc wireless networks.
CO5	Analyse different multiple access techniques for wireless communication.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	1	2	2	-	-	-	-	-	2	3	3	2
CO2	3	3	2	2	2	2	-	-	-	-	-	2	3	2	2
CO3	3	3	2	2	1	1	-	-	-	-	-	2	3	2	1
CO4	3	3	2	3	3	1	-	-	-	-	-	1	2	2	2
CO5	3	2	3	3	3	1	-	-	-	-	-	1	2	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	Subject Name: Introduction to DBMS	

	Course Outcomes
CO1	Explain the basic concepts of database systems, including data models, database architecture, and the role of a DBMS in managing data efficiently.
CO2	Design relational databases using Entity-Relationship (ER) modelling and apply normalization techniques (up to 3NF or BCNF) to eliminate redundancy and ensure data integrity.
CO3	Write and execute Structured Query Language (SQL) commands to create, manipulate, and retrieve data from relational databases, including advanced queries involving joins, subqueries, and aggregation
CO4	Explain and implement transaction management concepts, including ACID properties, concurrency control, and recovery techniques to ensure data consistency and reliability.
CO5	Implement basic database security measures, such as user authentication, authorization, and access control, and perform administrative tasks like backup and recovery.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	3	3	3	2	-	2	3	3	-	2	3	1	2
CO2	3	1	2	2	3	2	-	2	3	3	-	2	2	1	2
CO3	2	1	2	2	3	1	-	1	3	3	-	2	2	1	2
CO4	2	1	2	2	3	1	-	1	3	3	-	2	2	1	1
CO5	2	-	1	1	3	1	-	1	2	3	-	1	2	-	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	Subject Name: Essence of Indian Knowledge and Tradition	

	Course Outcomes
CO1	Bridge ancient Indian knowledge with modern ECE principles, fostering innovation, ethics, and scientific inquiry in their professional careers.
CO2	Bridge ancient Indian wisdom with modern electronics and communication technologies, fostering a scientific, ethical, and innovation-driven mindset.
CO3	Integrate Yoga and holistic health care with modern engineering for personal well-being, productivity, and innovative health tech solutions.
CO4	Explore and apply the essence of Indian knowledge and tradition in modern electronics and communication engineering, fostering innovation, sustainability, and ethical engineering practices.
CO5	Explore and integrate India's traditional knowledge systems with modern electronics and communication engineering, fostering innovation, sustainability, and ethical technological advancements.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2	3	2	3	2	2	1	3	3	2	3
CO2	3	3	3	2	3	3	3	3	2	2	2	3	3	3	3
CO3	2	1	2	2	2	3	3	3	3	2	2	3	2	2	3
CO4	3	3	3	2	3	3	3	3	2	2	2	3	3	3	3
CO5	3	3	3	2	3	3	3	3	2	2	2	3	3	3	3

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 5th	**Subject Name:** Digital VLSI Lab	

	Course Outcomes
CO1	Learn the basic principles of CMOS logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR). Develop the ability to design and implement basic CMOS logic gates using VHDL.
CO2	Develop skills in organizing and connecting logic gates to create a working full adder and half subtractor circuit.
CO3	Learn debugging techniques for verifying the functionality of the multiplexer by testing all possible select line combinations and ensuring correct output selection.
CO4	Simulate the decoder circuit using design and simulation software tools (e.g., Xilinx) to verify its functionality.
CO5	Gain a solid understanding of sequential circuits**,** Flip Flop designs**,** and logic optimization.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**2**	**1**	**3**	**3**	**1**	**-**	**-**	**2**	**1**	**-**	**1**	**2**	**3**	**2**
CO2	**3**	**3**	**2**	**3**	**2**	**1**	**1**	**-**	**1**	**1**	**-**	**1**	**1**	**3**	**1**
CO3	**3**	**2**	**1**	**3**	**3**	**1**	**-**	**1**	**1**	**1**	**-**	**1**	**2**	**1**	**3**
CO4	**3**	**3**	**3**	**2**	**3**	**2**	**1**	**1**	**2**	**2**	**1**	**2**	**2**	**1**	**1**
CO5	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**3**	**3**	**1**	**2**	**2**	**1**	**2**

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Control System Engineering Lab	

	Course Outcomes
CO1	Analyse the dynamic behaviour of servo motors by determining the transfer functions of DC and AC servomotors and understanding their role in control systems.
CO2	Evaluate the performance of compensator networks by studying the frequency response of lead and lag compensators for stability and phase correction in control systems.
CO3	Implement and validate control strategies such as ON/OFF and PID controllers in temperature control systems for real-world applications.
CO4	Demonstrate the working principles of sensors and transducers by analysing the characteristics of thermocouples, thermistors, LVDTs, and strain gauges for measurement applications.
CO5	Apply bridge circuits for precise measurement of electrical parameters like resistance, inductance, and capacitance, ensuring accuracy in instrumentation.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	3	-	-	-	2	1	1	2	3	2	3
CO2	3	3	2	3	3	-	2	-	1	1	-	2	3	3	3
CO3	3	3	3	3	3	2	2	-	2	2	1	3	3	3	3
CO4	3	3	2	3	3	1	2	-	2	2	1	3	3	2	3
CO5	3	3	2	3	3	-	2	-	1	1	-	2	3	2	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	Subject Name: Analog and Digital Communication Lab	

	Course Outcomes
CO1	Understand different modulation and demodulation techniques in analog and digital communication.
CO2	Apply signal and system analysis tools in the time and frequency domains, including Impulse response, convolution, frequency response, Fourier series, Fourier transform, and Hilbert transform.
CO3	Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.
CO4	Understand error control coding techniques.
CO5	Simulate the AM/FM modulation and demodulation system using MATLAB.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	PO1	PO2	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3	2	1	1	1	1	1	2	3	3	2
CO2	3	3	2	3	3	2	1	1	1	1	1	3	3	3	2
CO3	2	3	3	2	2	1	1	2	3	2	2	2	3	2	3
CO4	3	3	2	2	3	3	2	2	2	1	1	2	3	3	2
CO5	2	2	1	1	1	1	1	2	2	3	2	3	2	1	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Employability Skill-III	

	Course Outcomes
CO1	Develop placement enabled programming skill according to industry pattern.
CO2	Develop quantitative and reasoning skill for recruitment.
CO3	Develop coding skill for campus recruitment.
CO4	Develop techniques to solve Q and LR problems with in stipulated time.
CO5	Develop logical reasoning skills.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	1	-	-	3	3	3	-	-	3	1	2
CO2	3	3	3	3	1	-	-	2	2	2	-	-	3	1	2
CO3	2	2	2	2	1	-	-	2	2	2	-	-	3	1	2
CO4	2	2	2	1	-	-	-	2	2	2	-	-	3	1	1
CO5	1	1	2	1	-	-	-	2	2	1	-	-	3	-	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Summer Internship-I	

	Course Outcomes
CO1	Apply engineering knowledge and technical skills to solve real-world industry problems
CO2	Develop hands-on experience with industry tools, software, and modern technologies
CO3	Enhance teamwork, leadership, and professional communication skills in a workplace environment.
CO4	Understand ethical, societal, and environmental responsibilities in engineering practice.
CO5	Engage in lifelong learning by analysing emerging trends and innovations in the industry.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	2	2	2	1	1	2	3	3	3	3
CO2	3	3	3	3	3	2	2	1	1	1	2	3	3	3	3
CO3	2	2	2	2	2	3	2	3	2	2	3	3	3	3	2
CO4	2	2	2	2	2	3	3	3	2	2	2	2	3	3	2
CO5	3	3	3	3	3	2	2	2	3	3	2	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 5th	**Subject Name:** Mini Project-II	

	Course Outcomes
CO1	Demonstrate the ability to identify real-world problems and analyse requirements for developing a suitable solution.
CO2	Apply fundamental concepts of programming, circuit design, or embedded systems to implement an efficient and optimized solution.
CO3	Design, develop, and test a prototype/model using appropriate tools, techniques, and technologies.
CO4	Evaluate system performance using metrics such as speed, accuracy, efficiency, and propose improvements where necessary.
CO5	Effectively communicate the project's objectives, methodology, results, and findings through well-structured reports and presentations.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	1	2	1	1	2	2	2	3	3	2	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	3	3	2	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	3	1	1	1	1	1	1	1	3	3	3	3	2	3	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 6th	**Subject Name:** Internet of Things	

	Course Outcomes
CO1	Understand the fundamental concepts of the Internet of Things (IoT), including its physical and logical design, enabling technologies, and levels, while also gaining insight into domain-specific IoT applications such as home automation, smart cities, healthcare, agriculture, and industry.
CO2	Understand and apply M2M communication principles, differentiate between IoT and M2M, and utilize NETCONF-YANG for efficient IoT systems management, addressing network operator requirements and limitations of traditional SNMP-based management.
CO3	Analyse and apply various sensors (such as temperature, humidity, pressure, liquid level, vibration, and photo-electric sensors) along with signal conditioning and interfacing techniques to effectively convert physical parameters into usable electrical signals for real-world applications.
CO4	Design and develop IoT applications using Python by implementing logical programming constructs, handling data structures, and integrating file operations, modules, and packages to create efficient and scalable solutions.
CO5	Understand the fundamental building blocks of IoT devices and demonstrate proficiency in interfacing sensors and actuators with Raspberry Pi using Python programming.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	2	2	2	1	1	2	1	3	3	2	2
CO2	3	3	2	2	3	1	1	1	1	2	2	3	3	3	2
CO3	3	3	3	3	3	2	2	1	1	2	2	3	3	3	3
CO4	2	2	3	2	3	1	1	1	2	3	2	3	3	3	3
CO5	3	2	3	2	3	1	1	1	2	2	2	3	2	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Microwave and Antenna Engineering	

	Course Outcomes
CO1	Understand high-frequency transmission lines, wave propagation, and impedance matching.
CO2	Analyse waveguides, resonators, and microwave field solutions.
CO3	Understand microwave components, power dividers, and microwave oscillators.
CO4	Explore antenna radiation principles, array design, and impedance matching.
CO5	Understand the design and characteristics of various antennas.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	-	-	-	1	1	-	2	3	2	2
CO2	3	3	3	2	3	-	-	-	1	1	-	2	3	2	2
CO3	3	3	3	3	2	-	-	-	1	1	-	3	3	3	3
CO4	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	Subject Name: Computer Networking and Internet Protocol	

	Course Outcomes
CO1	Gain foundational knowledge of how data is transmitted over a network, preparing them for deeper studies in networking and telecommunications.
CO2	Develop a strong foundation in Data Link Layer protocols, LAN, and wireless communication technologies
CO3	Develop a comprehensive understanding of network and transport layer protocols, addressing, routing, and quality of service for efficient data communication.
CO4	Develop a strong understanding of application layer protocols, enabling them to work with real-world network services like web browsing, email communication, and file transfer.
CO5	Gain fundamental knowledge of data transmission, networking technologies, error handling, and telecommunication infrastructure.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	2	1	1	1	2	1	3	3	3	2
CO2	3	2	2	2	3	2	1	1	1	2	2	3	3	3	2
CO3	3	3	3	2	3	3	1	2	1	2	2	3	3	3	3
CO4	3	2	3	2	3	3	2	2	2	3	2	3	3	3	3
CO5	3	3	2	2	3	3	3	2	1	2	3	3	3	3	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Mobile Computing	

	Course Outcomes
CO1	Develop the ability to compare and contrast different wireless communication technologies, including PCS, GSM, GPRS, and WLANs.
CO2	Evaluate the evolution from WLL to 3G in the context of improving wireless communication.
CO3	Prepare for careers in satellite communication industries and related fields, including satellite design, network operations, and global telecommunications.
CO4	Explore emerging trends in wireless enterprise networks, including advancements in Bluetooth technology, pervasive computing, and adaptive web application architectures.
CO5	Gain a foundation for pursuing careers in mobile network design, wireless communication, and internet technologies.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	2	-	2	-	2	1	1	2	2	3
CO2	3	3	3	3	2	2	-	2	-	1	2	2	3	3	3
CO3	3	2	2	1	3		1	-	2	3	1	1	3	1	3
CO4	2	1	3	3	2	2	1	3	3	2	1	2	2	2	2
CO5	1	3	2	2	2	2	2	2	3	3	2	1	2	2	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Operating System	

	Course Outcomes
CO1	Develop a strong foundation in operating systems and their applications in electronics and computing.
CO2	Grasp process management, inter-process communication, multi-threading, and CPU scheduling, crucial for operating system design and performance optimization.
CO3	Build strong foundation in cloud infrastructure, virtualization, and real-world cloud service applications.
CO4	Develop technical and managerial skills for implementing and managing SaaS-based cloud solutions in real-world applications.
CO5	Gain technical expertise and managerial insights for ensuring security in cloud computing infrastructures.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	3	2	1	1	2	2	1	3	3	2	2
CO2	3	3	3	3	3	2	1	1	2	3	2	3	2	3	3
CO3	3	3	2	3	3	3	1	2	2	2	2	3	3	3	3
CO4	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Employability Skill-IV	

	Course Outcomes
CO1	Develop placement enabled programming skill according to industry pattern.
CO2	Develop quantitative and reasoning skill for recruitment.
CO3	Develop coding skill for campus recruitment.
CO4	Develop techniques to solve Q and LR problems with in stipulated time.
CO5	Develop logical reasoning skills.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	3	-	-	2	2	3	3	3	2	2
CO2	3	3	3	3	3	3	-	-	1	1	3	2	2	2	2
CO3	2	3	3	2	2	3	-	-	1	1	3	2	2	2	2
CO4	1	2	2	2	2	3	-	-	1	1	3	2	1	2	1
CO5	1	2	2	1	2	3	-	-	-	-	3	2	1	1	1

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Internet of Things Lab	

	Course Outcomes
CO1	Understand the use of different IoT devices like Arduino, NodeMCU, and Raspberry PI.
CO2	Apply Arduino programming skill in interfacing LEDs, LCDs, and seven segment displays.
CO3	Apply Arduino programming skill in interfacing temperature and humidity sensors.
CO4	Apply programming skill in uploading the temperature and humidity sensors data in ThingSpeak and Blynk.
CO5	Apply programming skills in python to use Raspberry PI for different applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	2	2	1	1	2	1	3	3	2	2
CO2	3	3	3	2	3	2	2	1	2	2	2	3	3	3	3
CO3	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3
CO4	3	3	3	3	3	2	2	1	2	2	2	3	3	3	3
CO5	3	3	3	3	3	2	3	2	2	2	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Microwave and Antenna Engineering Lab	

	Course Outcomes
CO1	Identify and analyse different microwave components such as waveguides, isolators, circulators, directional couplers, and terminations.
CO2	Calibrate a microwave test bench for conducting microwave experiments.
CO3	Analyse of Reflex Klystron Tube and Gunn diode characteristics.
CO4	Understand and analyse Implement transmission line equations and Smith Chart calculations using MATLAB.
CO5	Analyse the radiation pattern characteristics of antenna.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	3	-	-	-	1	1	-	2	3	2	2
CO2	3	3	3	3	3	-	-	-	1	2	-	3	3	3	3
CO3	3	3	2	2	3	-	-	-	1	1	-	2	3	3	3
CO4	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3
CO5	3	3	3	3	3	-	-	-	2	2	-	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Seminar-I	

	Course Outcomes
CO1	Develop the ability to research, analyze, and present technical topics effectively.
CO2	Enhance oral and written communication skills for technical documentation and presentations.
CO3	Improve critical thinking and problem-solving abilities through literature review and discussion.
CO4	Gain experience in professional ethics, teamwork, and interdisciplinary collaboration.
CO5	Develop lifelong learning skills by staying updated with emerging technologies and trends.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	2	3	2	1	–	–	2	3	2	3	2	3	2
CO2	1	2	2	2	2	1	–	–	2	3	2	3	2	3	2
CO3	2	3	2	3	2	1	–	–	2	3	2	3	2	3	2
CO4	1	2	2	2	2	2	1	3	3	3	3	2	2	2	2
CO5	2	3	2	3	2	1	1	–	2	3	2	3	3	3	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 6th	**Subject Name:** Grand Viva	

	Course Outcomes
CO1	Identify a real-world problem and analyse its requirements to propose an innovative solution.
CO2	Develop a functional prototype or model using appropriate tools, techniques, and technologies.
CO3	Apply engineering principles and domain-specific knowledge to design and optimize the project.
CO4	Collaborate effectively within a team and communicate project details through reports and presentations.
CO5	Test, validate, and refine the project-based knowledge on performance analysis and feedback.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	2	1	1	2	2	2	3	3	3	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	2	3	3	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	2	1	2	2	2	1	1	1	3	3	3	3	2	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 7th	Subject Name: Entrepreneurship Development	

	Course Outcomes
CO1	Equip with the necessary knowledge and skills to understand the entrepreneurial landscape, fostering an entrepreneurial mindset and encouraging the development of new business ventures.
CO2	Deal with the tools and knowledge required to recognize entrepreneurial opportunities, set up and manage small businesses, and contribute to the growth of the entrepreneurial ecosystem, especially in the technology-driven sectors.
CO3	Equip students with a comprehensive understanding of key business management concepts that are essential for managing and leading organizations in the electronics and engineering sectors.
CO4	Develop analytical and managerial skills to identify, prevent, and address industrial sickness while understanding the financial and policy frameworks that support business sustainability.
CO5	Develop a strong foundation in industrial planning, regulatory compliance, environmental responsibility, and government support mechanisms for business growth and sustainability.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	3	3	2	1	1	1	2	1	3	3	3	2
CO2	3	3	2	3	3	2	1	1	1	2	2	3	3	3	3
CO3	3	3	3	3	3	3	1	2	1	2	2	3	3	3	3
CO4	3	3	3	3	3	3	2	2	2	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	1	2	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 7th	Subject Name: Embedded System and Application	

	Course Outcomes
CO1	Describe the fundamental building blocks of a typical embedded system.
CO2	Explain the quality attributes of embedded systems and the co design approach for embedded hardware and firmware development.
CO3	Explain the elements of embedded hardware and their design principles and development steps.
CO4	Understand the need for an operating system and internals of RTOS based embedded firmware design.
CO5	Integrate, test, and manage an embedded system development lifecycle (EDLC).

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	1	1	-	1	-	-	-	-	-	2	3	1	-	2
CO2	3	2	3	-	1	-	2	-	-	1	2	2	2	1	2
CO3	1	2	1	1	1	-	1	-	-	-	3	2	1	1	2
CO4	2	1	1	1	2	1	-	-	-	-	2	3	1	1	2
CO5	2	3	3	1	2	1	1	-	-	2	2	2	3	1	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 7th	**Subject Name:** Data Science	

	Course Outcomes
CO1	Utilize Python and its fundamental libraries to perform essential data operations, including reading, selecting, filtering, manipulating, sorting, grouping, and visualizing data, within an integrated development environment (IDE).
CO2	Apply descriptive statistical methods and exploratory data analysis techniques to summarize, visualize, and interpret data distributions, measure asymmetry, and perform hypothesis testing using confidence intervals and p-values.
CO3	Evaluate and apply supervised learning models, including support vector machines and random forests, while interpreting learning curves to assess model performance across training, validation, and test datasets.
CO4	Apply regression analysis and clustering techniques to real-world datasets, assess model performance using appropriate metrics, and interpret results to make data-driven decisions.
CO5	Analyse the ethical, privacy, and security implications of data science applications and evaluate their impact on society.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	3	1	1	1	2	2	2	3	3	3	2
CO2	3	3	2	3	3	2	1	1	2	3	2	3	3	2	2
CO3	3	3	2	3	3	2	1	2	2	2	2	3	3	3	3
CO4	3	3	3	3	3	2	2	2	2	2	3	3	3	3	3
CO5	2	2	2	2	2	3	3	3	2	2	2	3	2	2	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 7th	Subject Name: Cloud Computing	

	Course Outcomes
CO1	Gain foundational knowledge of cloud computing and its applications in modern industries, technology-driven businesses, and engineering solutions.
CO2	Equip electronics engineering students with the essential knowledge to leverage cloud computing for engineering applications, business solutions, and technology-driven innovations.
CO3	Develop embedded systems, IOT, and networking, enhance virtualized resource management, and provides practical exposure to cloud infrastructure for technology-driven applications
CO4	Gain an understanding of SLAs, billing, cloud service management, data management, and large-scale data processing, and their impact on cloud infrastructure.
CO5	Understand cloud security at various levels, including data protection, authentication, SLAs, and apply security principles to real-world case studies.

	CO-PO Mapping												CO-PSO Mapping		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	3	2	2	1	1	2	2	3	3	2	2
CO2	3	3	2	2	3	2	2	1	2	2	3	3	3	3	2
CO3	3	3	3	3	3	2	2	1	2	2	3	3	3	3	3
CO4	2	2	2	3	3	2	2	2	2	2	3	3	2	3	2
CO5	2	2	2	3	3	3	3	3	2	2	3	3	2	3	3
Average	2.6	2.4	2.2	2.6	3	2.2	2.2	1.6	1.8	2	2.8	3	2.6	2.8	2.4

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 7th	**Subject Name:** Remote Sensing and GIS	

	Course Outcomes
CO1	Understand the basic services RSGIS & mechanisms for effective counter measures.
CO2	Understand different concepts and terms used in Remote Sensing and its data.
CO3	Understand the Data conversion process in different coordinate systems of GIS interface.
CO4	Evaluate the accuracy of data and implementing a GIS.
CO5	Understand the applicability of RS and GIS for various applications.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	1	3	2	1	3	2	1	2	3	3	3	3
CO2	3	3	3	2	3	2	1	2	2	3	3	3	3	3	3
CO3	3	3	3	3	3	2	1	2	2	3	2	3	3	3	3
CO4	3	3	3	2	3	2	1	2	2	2	3	3	3	3	3
CO5	3	3	3	3	3	3	1	3	2	3	3	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 7th	**Subject Name:** Minor Project	

	Course Outcomes
CO1	Demonstrate the ability to identify real-world problems and analyse requirements for developing a suitable solution.
CO2	Apply fundamental concepts of programming, circuit design, or embedded systems to implement an efficient and optimized solution.
CO3	Design, develop, and test a prototype/model using appropriate tools, techniques, and technologies.
CO4	Evaluate system performance using metrics such as speed, accuracy, efficiency, and propose improvements where necessary.
CO5	Effectively communicate the project's objectives, methodology, results, and findings through well-structured reports and presentations.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	1	2	1	1	2	2	2	3	3	2	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	3	3	2	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	3	1	1	1	1	1	1	1	3	3	3	3	2	3	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation

Semester: 7th	**Subject Name:** Summer Internship-II	

	Course Outcomes
CO1	Apply engineering knowledge and technical skills to solve real-world industry problems
CO2	Develop hands-on experience with industry tools, software, and modern technologies
CO3	Enhance teamwork, leadership, and professional communication skills in a workplace environment.
CO4	Understand ethical, societal, and environmental responsibilities in engineering practice.
CO5	Engage in lifelong learning by analysing emerging trends and innovations in the industry.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	2	2	2	1	1	2	3	3	3	3
CO2	3	3	3	3	3	2	2	1	1	1	2	3	3	3	3
CO3	2	2	2	2	2	3	2	3	2	2	3	3	3	3	2
CO4	2	2	2	2	2	3	3	3	2	2	2	2	3	3	2
CO5	3	3	3	3	3	2	2	2	3	3	2	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 7th	**Subject Name:** Seminar-II	

	Course Outcomes
CO1	Develop the ability to research, analyze, and present technical topics effectively.
CO2	Enhance oral and written communication skills for technical documentation and presentations.
CO3	Improve critical thinking and problem-solving abilities through literature review and discussion.
CO4	Gain experience in professional ethics, teamwork, and interdisciplinary collaboration.
CO5	Develop lifelong learning skills by staying updated with emerging technologies and trends.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	2	3	2	1	–	–	2	3	2	3	2	3	2
CO2	1	2	2	2	2	1	–	–	2	3	2	3	2	3	2
CO3	2	3	2	3	2	1	–	–	2	3	2	3	2	3	2
CO4	1	2	2	2	2	2	1	3	3	3	3	2	2	2	2
CO5	2	3	2	3	2	1	1	–	2	3	2	3	3	3	2

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 8th	**Subject Name:** Internship	

	Course Outcomes
CO1	Apply engineering knowledge and technical skills to solve real-world industry problems.
CO2	Develop hands-on experience with industry tools, software, and modern technologies.
CO3	Enhance teamwork, leadership, and professional communication skills in a workplace environment.
CO4	Understand ethical, societal, and environmental responsibilities in engineering practice.
CO5	Engage in lifelong learning by analysing emerging trends and innovations in the industry.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	2	2	2	1	1	2	3	3	3	3
CO2	3	3	3	3	3	2	2	1	1	1	2	3	3	3	3
CO3	2	2	2	2	2	3	2	3	2	2	3	3	3	3	2
CO4	2	2	2	2	2	3	3	3	2	2	2	2	3	3	2
CO5	3	3	3	3	3	2	2	2	3	3	2	3	3	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 8th	**Subject Name:** Grand Viva	

	Course Outcomes
CO1	Identify a real-world problem and analyse its requirements to propose an innovative solution.
CO2	Develop a functional prototype or model using appropriate tools, techniques, and technologies.
CO3	Apply engineering principles and domain-specific knowledge to design and optimize the project.
CO4	Collaborate effectively within a team and communicate project details through reports and presentations.
CO5	Test, validate, and refine the project-based knowledge on performance analysis and feedback.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	2	1	1	2	2	2	3	3	3	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	2	3	3	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	2	1	2	2	2	1	1	1	3	3	3	3	2	3	3

‘3’High	‘2’ Moderate	‘1’ Low	‘-’ No Correlation

Semester: 8th	**Subject Name:** Major Project	

	Course Outcomes
CO1	Demonstrate the ability to identify real-world problems and analyse requirements for developing a suitable solution.
CO2	Apply fundamental concepts of programming, circuit design, or embedded systems to implement an efficient and optimized solution.
CO3	Design, develop, and test a prototype/model using appropriate tools, techniques, and technologies.
CO4	Evaluate system performance using metrics such as speed, accuracy, efficiency, and propose improvements where necessary.
CO5	Effectively communicate the project's objectives, methodology, results, and findings through well-structured reports and presentations.

	CO-PO Mapping												**CO-PSO Mapping**		
Sl. No	**PO1**	**PO2**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	1	2	1	1	2	2	2	3	3	2	2
CO2	3	2	3	2	3	1	1	1	2	2	2	3	3	3	3
CO3	3	2	3	3	3	1	2	1	2	2	3	3	3	2	3
CO4	3	3	2	3	3	1	2	1	2	2	3	3	3	3	3
CO5	3	1	1	1	1	1	1	1	3	3	3	3	2	3	2

'3'High	'2' Moderate	'1' Low	'-' No Correlation