Gayatri Vidya Parishad College of Engineering for Women

Kommadi, Madhurawada
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Planning, Assessment and Attainment:

Tools and Techniques for Program Continuous Improvement

Regulation: R13

PART-I

Institute Vision

To emerge as an acclaimed centre of learning that provides value based technical education for the holistic development of students.

Institute Mission

- Undertake activities that provide value based knowledge in Science, Engineering and Technology
- Provide opportunities for learning through Industry – Institute interaction on the state of the art technologies
- Create a collaborative environment for the flourishment of research, innovation and entrepreneurship
- Promote activities that bring in a sense of social responsibility

Department Vision

Produce competitive engineers instilled with ethical and social responsibilities to deal with the technological challenges in the field of Electronics & Communication Engineering.

Department Mission

- Facilitate a value based educational environment that provides updated technical knowledge
- Provide opportunities for developing creative, innovative and leadership skills
- Imbue technological and managerial capabilities for a successful career and lifelong learning

Program Educational Objectives (PEOs)

- Analyze and apply the knowledge of Mathematics, Science and Engineering fundamentals for solving Electronics and Communication Engineering problems.
- Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.
- Excel in chosen career by exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.

Establish consistency of PEOs with Mission of the Department

Preparation of matrix of PEOs and elements of Mission statements

The key elements of Mission statements are

1. Core competency with ethical values (M1).
2. Creativity and leadership (M2).
3. Desire for learning (M3).

The elements of the Mission statements and PEOs are mapped as given in the Table below.

PEOs & Mission matrix

	Elements of Mission Statements		
	M-1	**M-2**	**M-3**
Program Educational Objectives	Core competency with ethical values	Creativity and leadership	Desire for learning
PEO1: Analyze and apply the knowledge of Mathematics, Science, and Engineering concepts for solving Electronics and Communication Engineering problems.	3	2	2
PEO2: Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.	2	3	2
PEO3: Excel in chosen career by exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.	2	2	3

Note: M1, M2,... Mn are distinct elements of Mission statement. Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

It there is no correlation, put "-"

Consistency/Justification of co-relation parameters of the PEO-Mission matrix of the Department

Justification of mapping of PEOs with Mission statements

	Mapping levels with Mission statements			Justification
PEO Statement	**M1**	**M2**	**M3**	
PEO1: Analyze and apply the knowledge of Mathematics, Science, and Engineering concepts for solving Electronics and Communication Engineering problems.	**3**	**2**	**2**	PEO1 strongly maps to M1 as the student applies the knowledge gained from the core subjects, displaying competency in the field of knowledge. PEO1 moderately maps to M2, since the students also require concepts of advanced technology in addition to the basic knowledge to improve the creative thinking. PEO1 moderately maps to M3. The capability of students to analyze and apply the knowledge gained from the core subjects would also involve a zeal for learning.
PEO2: Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.	**2**	**3**	**2**	PEO2 moderately maps to M1. The students understand the problem through the knowledge gained from the core subjects for solving the complex problems in Electronics and Communication Engineering. PEO2 strongly maps to M2. To solve the complex problems in Electronics and Communication Engineering, student requires creativity and leadership skills. PEO2 moderately maps to M3. In order to have a better solution for the complex problems in Electronics and Communication Engineering, curiosity for learning is also required.
PEO3: Excel in chosen career by	**2**	**2**	**3**	PEO3 moderately maps to M1. The student's ability to exhibit life skills and

exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.				adopt continuous learning requires the core competency with ethical values. PEO3 moderately maps to M2. The learning attitude of student requires creativity and leadership skills. PEO3 strongly maps to M3 as the continuous learning mainly requires an eagerness to learn..

Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Engineering graduate will be able to

PO-1: Apply Knowledge of Mathematics, Science and Engineering fundamentals in the field of Electronics and Communication and its allied areas.

PO-2: Identify, formulate and analyze complex Electronics and Communication Engineering problems using the principles of Mathematics and Engineering Sciences to reach substantiated conclusions.

PO-3: Design system components or processes for the solutions of complex Electronics and Communication Engineering problem to meet the needs of public health, safety, societal and environmental issues.

PO-4: Conduct experiments by using domain knowledge for analysis, interpretation and synthesis of the electronics and communication engineering problems to provide valid conclusions.

PO-5: Use appropriate techniques, resources and modern Engineering & IT tools to model and simulate complex Electronics and Communication Engineering problems.

PO-6: Apply contextual knowledge to assess societal, health, safety, legal & cultural issues and its consequent responsibilities relevant to Electronics and Communication Engineering practices.

PO-7: Apply professional engineering solutions in societal and environmental issues for the sustainable development.

PO-8: Apply the principles of professional ethics and responsibilities to social issues.

PO-9: Function effectively as an individual and as a leader in diverse and multidisciplinary teams.

PO-10: Communicate proficiently through presentations and connect a range of audience with an effective oral and written communication.

PO-11: Apply the knowledge of engineering and management principles to manage projects in multidisciplinary environment.

PO-12: Develop and recognize the need for an ability to engage in life- long learning for the changing technological environment.

PSO-1: Acquire knowledge required for designing Electronics and Communication systems.

PSO-2: Design, simulate and implement essential modules in the areas of Electronic circuits, VLSI, Embedded systems, Communication and Signal processing.

Guidelines to formulate Course

- Six COs for theory to be formulated and each should inline with every unit of the course
- Five COs for lab to be formulated and each should map the set of experiments listed in the lab course.
- Need to find a appropriate cognitive level for each CO and assign a suitable verb as per Blooms Taxonomy to frame the CO

Course Outcomes

1st Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
SH101	English -I	CO1	Develop an understanding how Gandhi grew in introspection and maturity, to emulate G.D.Naidu and take to practical applications; develop the skill of Mind Mapping and Paragraph Writing.
		CO2	Plan for a higher quality of life, strength and sovereignty of a developed nation, to achieve much at a low cost and help the common man like G.R. Gopinadh, apply punctuation
		CO3	Relate the scientific attitude to solve many problems which we find difficult to tackle, develop the skill of Summary writing.
		CO4	Understand to write clearly and logically; relate that all men can come together and avert the peril, develop essay writing skills.
		CO5	Develop thinking scientific phenomena from a different angle and get exposure to poetic expressions; make use of multiple fields of knowledge for social service like Sudha Murthy; apply e-correspondence in professional field.
		CO6	Understand humorous texts and use words for irony; identify and make use of Vijay Bhatkar's contributions, develop argumentative essay writing skills.
SH102	Mathematics –I	CO1	Solve the first order, first degree differential equations and apply the techniques to engineering applications.
		CO2	Solve the higher order differential equations with constant coefficients and apply it to solve physical situations whose behaviour can be described by Linear D.E.
		CO3	Determine Laplace Transforms of various functions and apply it to solve linear ODE with initial conditions.
		CO4	Utilize multivariate differential calculus concepts to determine the extrema of multivariable functions.
		CO5	Solve the linear and non linear partial differential equations of first order.
		CO6	Solve higher order linear partial differential equations with constant coefficients and utilize the method of separation of variables to One dimensional wave, heat and two dimensional Laplace equations.
SH103	Mathematics –II	CO1	Solve algebraic, transcendental and simultaneous equations using numerical methods like Bisection, False-Position, Iterative and Newton Raphson method.
		CO2	Construct an interpolating polynomial for the given data and estimate the value of an unknown function at a given point using Newton forward, backward, Gauss forward, backward and Lagrange

			interpolation formulae
		CO3	Solve the ordinary differential equations numerically using Taylor, Picard, Euler's and RK methods.
		CO4	Determine Fourier Series of an arbitrary function over a given range.
		CO5	Determine the Fourier Transform, sine, cosine transforms and Inverse Fourier transforms of given function and evaluate integrals using Fourier integral theorem.
		CO6	Determine the Z-transform and inverse Z-transform of given function and utilize them to solve difference equations.
SH104	Engineering Physics	CO1	Understand the concepts of thin film interference and distinguish different types of diffraction by applying them in the calculation of resolving power of optical instruments. Explain the types of polarization and their conversion using wave plates.
		CO2	Learn the principles of working of laser systems and apply them in fibre optic communications. Describe the structural properties of materials.
		CO3	Explain the response of materials to external electric and magnetic fields. Understand the characteristics and applications of superconductivity.
		CO4	Interpret the basics of architectural acoustics and understand the basic principles of electro-magnetic fields through Maxwell's Equations.
		CO5	Explain and apply the fundamentals of Quantum Mechanics in free electron theory and band theory to study the conduction mechanism of electrons in solids.
		CO6	Infer the mechanism of electrical conduction in solids, especially the semiconductors which are the basic materials for electronic devices.
SH105	Professional Ethics and Human Values	CO1	Apply the moral template inculcating the core human values for transformation into an ethical human being
		CO2	Utilize the principles of engineering ethics for development of professionalism and professional competencies and also to solve moral dilemmas
		CO3	Explain and understand accountability, engineering codes and experimental nature of engineering.
		CO4	Evaluate the responsibility and accountability of a professional engineer towards design, operation, safety, by adopting risk benefit analysis
		CO5	Judge issues pertaining to individual rights, collegiality, moral dilemmas and conflicts while discharging their professional duties
		CO6	Analyse cross cultural issues in different ethical domains by acquiring knowledge on intellectual property rights in the context of globalization
SH106	Engineering Drawing	CO1	Make use of graphic representation as per standards and to construct polygons, ellipse and scales.
		CO2	Identify and draw the orthographic projection of points & straight lines placed in various quadrants
		CO3	Identify and draw the projection of straight lines inclined to both the planes
		CO4	Identify and draw the projection of planes inclined to both the planes.
		CO5	Plan and draw the projection of solids in different positions & inclined to one of the planes.

		CO6	Interpret orthographic and isometric views of objects.
SH110	Applied / Engineering Physics – Virtual Labs - Assignments	CO1	Inculcate basic scientific concepts through a virtual studying and learning environment within short duration of time
		CO2	Execute experiments through simulations which are difficult to do in the real laboratories either because of their risk and/or high cost of the equipment
		CO3	Develop skills for technical documentation as well as exploration for any project/research which they do at later stages

Laboratory Courses

Course Code	***Course Title***	***Experiment No***	***Course Outcomes***	
SH107	English Communication Skills Lab-I	1,2	CO1	Identify and pronounce vowel sounds, make use of expressions for greeting, taking leave and for introducing.
		3,4	CO2	Identify and pronounce diphthongs, make use of expressions for asking and giving information.
		5,6	CO3	Identify and pronounce consonants make use of expressions for inviting, accepting and declining invitations.
		7,8	CO4	Make use of expressions for giving commands, instructions, requests, appropriate syllable and accent.
		9,10	CO5	Identify different tones in connected speech and make use of expressions for giving suggestions, opinions.
SH108	Engineering Physics Lab	4,5	CO1	Determine the elastic modulus of given material and Moments of inertia of various types of pendulums.
		1,2,3	CO2	Operate optical instruments (Spectrometer and travelling microscope) to understand principles of interference and diffraction of light.
		6	CO3	Understand the modes of mechanical vibrations and determine their frequency.
		13	CO4	Apply tangent law to study the variation of magnetic fields due to current carrying conductors.
		10,11,12,14	CO5	Estimate the Energy band gap, thermal coefficients of resistance for semiconductors and understand the volt -ampere characteristics of diodes.
SH109	Engineering Workshop Lab and IT workshop Lab	5,6	CO1	Select tools required for getting required shape and size of the object and Compare process of least wastage of material and economy in process.
		1,2,3,4	CO2	Prepare various joints with the available work materials i.e with wood, M.S flats.
		7,8,9,10	CO3	Understand and connects different circuits in house wiring. Further, Identify parts/peripherals of CPU, experiment with system assembling, disassembling, OS installation and summarize Linkers, Loaders, Assemblers, Interpreters.
		1,2,3,4,5,6,7,8	CO4	Experiment with Network configuration, Soft ware installation, Internet, Trouble shooting.
		9,10,11,12,13, 14	CO5	Make use of MS-WORD, EXCEL, POWER POINT and ACCESS to prepare different types of documents.

2nd Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
SH201	English –II	CO1	Identify the proposed technology as it serves the human instead of making him the servant, the achievements of Bose to start his own original work, develop writing official letters
		CO2	Understand that the climate must be preserved and maintained, follow Babha's achievements, and make his own experiments, develop letters of application, CV
		CO3	Make use of modern technologies and adopt the applications like nano-technology, apply e-correspondence in professional field.
		CO4	Understand that water is the elixir of life, development is impossible without scientific research, develop official reports, technical report writing.
		CO5	Develop to work hard with devotion and dedication, appreciate the art of writing a short story and trying his hand at it, develop note making, telephone conversation
		CO6	Understand the advantages of work, overcome their personal problems and address themselves to national and other problems, describe objects and processes
SH202	Mathematics –III	CO1	Determine the rank of a matrix and Solve linear system of equations using Rank and iterative methods
		CO2	Determine Eigen values and Eigen vectors of a matrix and apply the concept to examine the nature of quadratic forms
		CO3	Explain double and triple integrals and apply them to determine length; area and volume of revolution
		CO4	Examine the properties of Beta and Gamma functions and apply them to solve improper integrals.
		CO5	Apply vector differential operator on scalar and vector point functions and determine directional derivative, angle between two surfaces.
		CO6	Determine the work done using Line Integrals and evaluate line, surface and volume integrals using Green's Theorem, Stoke's Theorem and Gauss Divergence theorem.
SH203	Engineering Chemistry	CO1	Gain knowledge about chemistry of hard water-boiler troubles and modern methods of softening of hard water
		CO2	Make use of electrochemical reactions in understanding the construction and working of batteries and fuel cells
		CO3	Classify corrosion, its causes and modern control methods
		CO4	Understand the preparation, properties, advantages and limitations of plastic materials and relate the ideas to engineering applications
		CO5	Compare and relate the advantages, limitations of different fuels with the computational air requirements for combustion
		CO6	Utilize fundamentals of applied chemistry to acquire knowledge of advanced materials and their applications.
SH204	Engineering Mechanics	CO1	Understand the concepts of moment, friction and its applications
		CO2	Analyze the given physical problem for finding the unknown reaction forces by using equilibrium equations & graphical method
		CO3	Determine the centroid and centre of gravity of the given plane area and solid body
		CO4	Estimate area and mass moment of inertia of a plane area and solid body

		C05	Evaluate the displacement, velocity and acceleration of a particle subjected to rectilinear and curvilinear motion & methods of representing plane motion
		C06	Apply work energy principle, impulse momentum principle for connected systems
CS201	Computer Programming	CO1	Explain the working of Computer hardware and illustrate algorithm and a flowchart design for a given problem in C.
		CO2	Make use of different operators in C by understanding programming structures.
		CO3	Demonstrate Modular programming for recursive solution formulation.
		CO4	Make use of pointers for dynamic memory allocation.
		CO5	Choose user defined data types including structures and unions to solve problems.
		CO6	Classify the concepts in files based on input and output.
EE202	Network Analysis	CO1	Apply the basic concepts and laws to electrical circuits using network reduction techniques.
		CO2	Analyze the behaviour of RLC networks for sinusoidal excitations
		CO3	Summarize the concepts of magnetic coupled circuits and analyze the concept of resonance for the performance of RLC circuits
		CO4	Simplify electrical networks by using principles of network theorems
		CO5	Determine the parameters of two port networks
		CO6	Evaluate the transient response of electrical networks for different types of excitations

Laboratory Courses

Course Code	***Course Title***	***Experiment No***	***Course Outcomes***	
SH205	Engineering Chemistry Lab	1&15	CO1	Make use of experimental skills for volumetric titrations and perform acid - base titrations using indicators
		3,&15	CO2	Demonstrate an understanding of redox titrations like permanganometry and estimation of vitamin c in different samples
		6 & 7	CO3	Apply the principles of complex metric titrations to determine hardness of water, amount of Zinc and Copper using EDTA in the given samples
		8,9,10,11,12, & 13	CO4	Perform Experiments with instruments such as conductometer, pH meter to acquire skills of conductometric titrations and chemical analysis
		14, 4 & 5	CO5	Estimate the amount of Ferric Iron in the sample using Potassium Dichromate
SH206	English Communication Skills Lab-II	1,2	CO1	Interpret non verbal symbols in communication
		3,4	CO2	Develop conversational skills, Telephone etiquette, making a small talk
		5,6	CO3	Develop language skills for presentation with confidence, clarity and conviction
		7,8	CO4	Develop ideas logically and forcefully using appropriate language in group discussion
		9,10	CO5	Develop to participate in interviews confidently.

CS201	C Programming Lab		CO1	Illustrate flowchart and algorithm to the given problem and make use of basic Structure of the C-programming, declaration and usage of variables.
			CO2	Build C programs using different types of operators, conditional, iterative statements to solve real time problems.
			CO3	Develop C programs using arrays, strings and functions concept.
			CO4	Make use of pointers and dynamic memory management functions to implement C-programs.
			CO5	Utilize files concept to show input and output of files in C and user defined data types including structures and unions to solve problems.

3rd Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
SH302	Managerial Economics and Financial Analysis	CO1	Learn the concepts of Managerial Economics and utilize the demand forecasting methods to predict demand of a product.
		CO2	Make use of Production function & economies of scale and assess the BEP of their own business.
		CO3	Understand the concepts of competitive market situations.
		CO4	Classify the types of business organizations and identify the stages of business cycles to improve the organizations.
		CO5	Analyze accounting concepts to prevent loss for the organization.
		CO6	Identify the sources of raising capital for business undertaking.
EC301	Electronic Devices and Circuits	CO1	Outline the basic concepts of semiconductor physics.
		CO2	Understand the concept of formation of a p-n junction and the construction of different diodes.
		CO3	Analyze the working of rectifiers and filters with relevant expressions.
		CO4	Understand the operation and analyze the characteristics of BJT and FET in different configurations.
		CO5	Apply proper biasing and stabilization methods to BJT and FET circuits.
		CO6	Analyze BJT and FET amplifier circuits using small signal low frequency model.
CS302	Data Structures	CO1	Analyze various recursive algorithms and interpret different searching & sorting techniques.
		CO2	Explain the operations of stack and queue and extend their applications.
		CO3	Illustrate list representation models in various types of applications.
		CO4	Construct a binary tree by using different linear data structures stacks and linked lists and Examine their operations.
		CO5	Build a binary search tree and relate its various tree traversal techniques.
		CO6	Summarize the concepts of graph representations, graph traversals and spanning trees.
SH303	Environmental Studies	CO1	Identify the current global environmental challenges and interpret the concept of ecosystem, its function and discover the need for protecting the producers and consumers in various ecosystems of the food web.
		CO2	Compare and contrast the variety of natural resources available and their importance for the sustenance of the life and recognize the need to conserve the natural resources.

		CO3	Identify the hotspots and threats to Biodiversity in India and develop conservation practices to protect biodiversity.
		CO4	Understand various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices.
		CO5	Explain social issues, problems and concerns related to energy, water, resettlement and the possible means to combat the challenges and further understand environmental issues and solutions towards sustainable development.
		CO6	Assess environment, stages involved in EIA and the environmental audit ,eco tourism.
EC302	Signals & Systems	CO1	Classify different types and operations on signals. Build the analogy between vectors and signals to develop the Fourier series concept.
		CO2	Apply the Fourier concept to analyze the spectral characteristics for different classes of signals.
		CO3	Analyze the process of sampling, its effects and reconstruction of signal from its samples.
		CO4	Analyze the process of convolution to examine the response of LTI systems.
		CO5	Apply the Laplace transform to analyze continuous LTI systems.
		CO6	Apply the Z- transform to analyze DT LTI systems using the concept of ROC.
EE305	Electrical Technology	CO1	Summarize the principle of electromechanical energy conversion of single excited and multi excited machines.
		CO2	Outline the principle of operation, constructional details and operational characteristics of DC generators.
		CO3	Illustrate the principle and characteristics of DC motors, starting and speed control methods of DC motors.
		CO4	Develop the equivalent circuit and evaluate the performance of transformers.
		CO5	Analyze the torque – slip characteristics and starting methods of 3-Ø induction motor.
		CO6	Outline the principle of operation of single phase induction motor, shaded pole motor, capacitor motor and AC servo motor.

Laboratory Courses

Course Code	*Course Title*	*Experiment No*	*Course Outcomes*	
EC303	Electronic Devices and Circuits Lab	1,2,3	CO1	Analyze the characteristics of P-N junction diode and Zener diode. Build the rectifier circuits and regulator circuits using diode.
		4,5	CO2	Analyze the operation and characteristics of BJT and FET in different configurations, which can be used in the design of amplifiers.
		6	CO3	Understand the operation of unipolar junction transistor by examining UJT for its characteristics.
		7	CO4	Design the biasing circuits for transistor.
		8,9,10	CO5	Design amplifier circuits using BJT and FET. Find the frequency response of amplifier to determine its bandwidth.
EE306	Networks & Electrical Technology	4,5,6 (Part-A)	CO1	Analyze the circuits using Kirchhoff's voltage & current laws, node analysis and network theorems.
		1(Part-A)	CO2	Determine the transient responses of simple circuits with

	Lab			capacitors and inductors.
		3 (Part-A)	CO3	Determine the frequency responses of circuits containing capacitors and inductors.
		4 (Part-**B**)	CO4	Determine the performance of a single phase transformer by conducting Open Circuit (O.C) and Short Circuit (SC) tests.
		1,2,3,5 (Part-B)	CO5	Analyze the performance characteristics of 3ϕ Induction Motor, DC shunt motor and DC shunt generator.

4th Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
EC401	Electronic Circuit Analysis	CO1	Design and analyze small signal high frequency amplifiers using BJT and FET.
		CO2	Design and Analyze multistage amplifiers.
		CO3	Design different types of feedback amplifiers.
		CO4	Interpret the condition for oscillations in oscillators and design different types of oscillators.
		CO5	Examine different types of power amplifiers and compare them in terms of efficiency.
		CO6	Analyze and compare different Tuned amplifiers.
SH402	Management Science	CO1	Appraise the practices of management concepts in the business environment and evaluate various types of organization structures.
		CO2	Identify the production management practices and distinguish the different stock levels of an organization.
		CO3	Prepare an appropriate marketing mix and determine the recruitment process in global competitive environment.
		CO4	Evaluate the project process on the basis of costs and time.
		CO5	Recognize and analyze the strategies of the firm and can re discover the SWOT of themselves.
		CO6	Understand and develop the contemporary management practices such as MIS, MRP, TQM, ERP, BPO and assess the changing business environment.
EC402	Random Variables & Stochastic Processes	CO1	Estimate the nondeterministic parameters with the knowledge of distribution and density functions of the probability.
		CO2	Analyze the random data by computing the various moments.
		CO3	Examine the behaviour of combination of the random variables by extending the concept of the single random variable to multiple cases.
		CO4	Understand the Temporal characteristics of the Random processes.
		CO5	Determine the behaviour of the Random processes in spectral domain.
		CO6	Analyze the LTI systems with stationary random process as input in the presence of different types of noise.
EC403	Switching Theory & Logic Design	CO1	Represent signed binary numbers using different number systems and binary codes
		CO2	Apply Boolean algebra, K-maps and Tabular method to minimize logic functions.
		CO3	Make use of combinational circuits to implement combinational logic functions.
		CO4	Develop combinational circuits using PLD's.

		CO5	Construct sequential circuits like counters and registers using flip-flops.
		CO6	Model the minimized Finite State Machines by using state diagrams.
EC404	EM Waves and Transmission Lines	CO1	Determine steady Electric and magnetic fields using various laws for different configurations.
		CO2	Apply the Maxwell equations to analyze the time varying behaviour of EM waves.
		CO3	Analyse the uniform plane wave characteristics in different media.
		CO4	Examine the wave characteristics for normal and oblique incidence and derive the relation for the power flow mechanism.
		CO5	Classify different types of transmission lines based on primary and secondary constants.
		CO6	Derive the input impedance relations for different transmission lines and interpret the same with the smith chart.
EC405	Analog Communications	CO1	Understanding of the basic concepts of analog communication system. Explain the methods of generations and detection of Amplitude Modulation (AM) signals.
		CO2	Apply the Principles of AM to analyze DSB SC,SSB ,VSB modulation and detection techniques.
		CO3	Explain the concepts of angle modulation schemes, Generation and detection of frequency modulated signals. Comparison of relative advantages and disadvantages FM over AM.
		CO4	Derive & estimate different types of noise in various analog communication systems.
		CO5	Build & construct AM, FM transmitters and Receivers. Analyze the performance.
		CO6	Understanding about performance of analog pulse communication systems. Generation and detection of PAM, PDM, PPM techniques.

Laboratory Courses

Course Code	***Course Title***	***Experiment No***	***Course Outcomes***	
EC406	Electronic Circuit Analysis Lab	6,7,8	CO1	Design and analyze various amplifiers (Multi stage amplifiers and Single tuned amplifier).
		4,5	CO2	Design and analyze various oscillators (RC phase shift oscillator and Colpitt's oscillator).
		2,3	CO3	Design and analyze feedback amplifiers (voltage series and current shunt feedback amplifiers).
		9,11,12	CO4	Design and analyze power amplifiers (Class A and Class B complimentary symmetry).
		2-12	CO5	Become expert with computer skills (Multisim, OrCAD Pspice and Capture) for the analysis and design of circuits.
EC407	Analog Communications Lab	A,B,D,F	CO1	Apply tools like MATLAB and Simulink for the functionality of analog modulation and demodulation environment.
		E,G,K	CO2	Analyze the concepts, wiring and simulate Amplitude modulation and Demodulation process in Communication.

		H	CO3	Interpret various Frequency modulation and Demodulation process and its applications.
		I,J	CO4	Analyze the concepts and simulate analog pulse modulation techniques.
		A,B,D,E,F,G, H,I,J,K	CO5	Design using hardware AGC, Pre-Emphasis and De-Emphasis circuits to analyze its response.

5th Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
EC501	Pulse & Digital Circuits	CO1	Understand the response of different Linear wave shaping circuits like LPF and HPF to various inputs.
		CO2	Determine the response of the different Non-Linear wave shaping circuits like Clippers and Clampers.
		CO3	Distinguish the constructional differences between Logic gates in various logic families.
		CO4	Analyze different types of multi vibrators and their design procedures.
		CO5	Understand the operation of different time base generators.
		CO6	Learn Principles of synchronization and frequency division and to understand the Sampling gates.
EC502	Linear IC Applications	CO1	Utilize basic circuits to realize IC 741 Op-Amp.
		CO2	Understand the characteristics of Op-Amps and apply them for the measurement of design compensating circuits.
		CO3	Make use of linear and non linear characteristics of Op-Amp in building applications.
		CO4	Understand the concepts of active filters, multipliers and modulators.
		CO5	Understand the basic architecture of IC 555 timer and IC 565, IC 566 to design PLL's and Oscillators.
		CO6	Compare and contrast DAC and ADC based techniques and specifications.
EE507	Control Systems	CO1	Measure the overall transfer function of the physical systems by mathematical modelling.
		CO2	Determine the overall transfer function of the physical systems by block diagram algebra and signal flow graph methods.
		CO3	Evaluate the time response specifications of second order systems and its error constants.
		CO4	Analyze absolute and relative stability of LTI systems using Routh's stability criterion and the Root locus method.
		CO5	Analyze the stability of LTI systems using frequency response methods by using Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
		CO6	Develop the state space models to solve time invariant state equations and understanding the concepts of controllability and observability.
EC503	Digital System Design & Digital IC Applications	CO1	Develop the internal circuits for different digital operations and model them using hardware description languages like VHDL.
		CO2	Make use of EDA tools of VHDL in building a digital module using synthesis approach.

		CO3	Utilize PLA, PAL and PROM in understanding complex digital design modules and code converters.
		CO4	Understand the electrical behaviour of CMOS both in static and dynamic conditions.
		CO5	Construct a Digital design module such as the combinational and sequential in real time applications.
		CO6	Extend the digital operations using digital ICs and understand the implementation of complex circuits using EDA tools.
EC504	Antennas and Wave Propagation	CO1	Understand the radiation mechanism of an antenna and identify the basic antenna parameters.
		CO2	Apply Maxwell's equations to quantify the fields radiated by different types of thin linear wire antennas.
		CO3	Distinguish various types of antenna Arrays.
		CO4	Construct and analyze non resonant antennas and Broad band antennas.
		CO5	Analyze UHF, Microwave antennas and assess antenna performance by suitable measurement technique.
		CO6	Identify the characteristics of radio wave propagation.
SH502	IPR& Patents	CO1	Recall and relate the real property law with Intellectual property law.
		CO2	Outline the subject matters of copyright and could able to demonstrate the registration procedure and infringement consequences.
		CO3	Make use of Rights and Limitations under Patent Law and could make new inventions and developments in Patent Law.
		CO4	Understand the Trade Mark Registration Process, maintenance, Inter parties Proceedings, Infringement, Ownership of Trade Mark and Litigations.
		CO5	Utilize maintaining Trade Secret, Physical Security, Employee Access Limitation, Employee Confidentiality Agreement of Trade Secret Law.
		CO6	Recall and relate the real property law with Intellectual property law.

Laboratory Courses

Course Code	***Course Title***	***Experiment No***	***Course Outcomes***	
EC505	Pulse & Digital Circuits Lab	1,2,3	CO1	Design the various linear and nonlinear wave shaping circuits.
		4	CO2	Justify that the transistor acts as a switch.
		8,9,10,11	CO3	Design and test bistable, monostable and astable multivibrators.
		12,13	CO4	Make use of different time base generators to generate sweep signal.
		5,6,7	CO5	Understand sampling gates and to design NAND and NOR gates using various logic families.
EC506	LIC Applications Lab	1	CO1	Learn ICs – IC 723, IC 7805, IC 7902, IC 7912 – functioning, parameters and Specifications.
		2,3,4,15	CO2	Analyze and design various applications using Op-amp.
		5,6,7	CO3	Realize analog active filters, oscillators and Schmitt trigger using Op-amp.
		8,9,10	CO4	Design monostable and astable multivibrators using

				Schmitt trigger circuit.
		13,14	CO5	Realize voltage regulator IC 7805, 7809, 7912 using IC 723.
EC507	Digital System Design & DICA Lab	1-11	CO1	Develop data flow, behavioural and structural models for digital circuits.
		1-11	CO2	Simulate VHDL models of digital circuits using CAD tool.
		1-11	CO3	Analyze the subsystems/ modules using CAD tool.
		1-4,9	CO4	Determine the necessary requirements for emulating the outputs on FPGAs.
		1-4,9	CO5	Implement and test simple digital circuits on FPGA.

6th Semester

Theory Courses

Course Code	*Course Title*	*Course Outcomes*	
EC601	Microprocessors and Microcontrollers	CO1	Comprehend the architecture, addressing modes and instruction set of various 16 bit microprocessors (8086, 8088).
		CO2	Apply assembly language programming skills to perform arithmetic, logical and string operations with 8086.
		CO3	Develop applications involving interfacing of various peripherals with 8086 microprocessor.
		CO4	Appraise the architecture, addressing modes and instruction set of 80386 and 80387 Co-processor.
		CO5	Design microcontroller based standalone applications for societal needs.
		CO6	Illustrate the features and architecture of 16C61/71 PIC microcontroller and ARM processor.
EC602	Digital Signal Processing	CO1	Examine the properties of discrete – time (DT) systems and in particular of Linear – Time Invariant systems, and solve Linear constant coefficient difference equations to obtain the response of a DT system to a given input.
		CO2	Apply spectral estimation tools like Discrete Fourier Series (DFS) and Discrete Fourier Transform (DFT) and demonstrate Fast Fourier Transform algorithm for faster computation of DFT.
		CO3	Apply Z – Transform to obtain the response of a DT system and its transfer function, and develop different realizations of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters.
		CO4	Design IIR and FIR filters to meet specific filtering criteria and compare the characteristics of IIR and FIR filters.
		CO5	Analyze the basics of Multirate Digital Signal Processing, and design interpolators and decimators to implement Sampling Rate conversion.
		CO6	Outline the architecture of programmable Digital Signal processors
EC603	Digital Communications	CO1	Illustrate the various types of pulse digital modulation techniques.
		CO2	Explain band pass digital modulation and demodulation techniques such as binary and M-ary schemes.
		CO3	Determine the probability of error for various digital modulation techniques like ASK, FSK, QPSK.

		CO4	Evaluate the channel capacity of discrete and analog channels using information theory.
		CO5	Compare different error control coding schemes for the reliable transmission of digital information over the channel.
		CO6	Examine the design aspects of a digital communication system.
EC604	Microwave Engineering	CO1	Analyze the field components in rectangular wave guides.
		CO2	Analyze the field components in circular wave guides & Cavity resonators.
		CO3	Examine different types waveguide junctions and components.
		CO4	Compare and Explain various microwave oscillators and amplifiers.
		CO5	Analyze the slow wave structures and cross field devices.
		CO6	Experiment with and Evaluate wave guide parameters using microwave bench.
EC6OA	Open Elective (Bio Medical Engineering)	CO1	Apply the electronic principles to medicine and summarize the origin of Bioelectric potentials such as ECG, EEG and EMG.
		CO2	Understand the Biomedical applications of Electrodes and Transducers.
		CO3	Develop the Cardiovascular and Respiratory Measuring Devices.
		CO4	Construct the various patient monitoring and therapeutic Instruments.
		CO5	Make use of Imaging and Biotelemetry equipment for solving the health care disorders.
		CO6	Interpret the use of Biopotential amplifiers, recorders and isolated power distribution system.
GW6SA	Seminar	CO1	Outline the important concepts to gain factual knowledge.
		CO2	Organise the presentation and disseminate ideas effectively with good communication skills.
		CO3	Develop self learning & time management skills to engage in continuous learning.
		CO4	Synthesize and reflect on to show the depth of knowledge in a compelling, well structured and professional behaviour.
		CO5	Develop writing skills with clarity of thought and expression.

Laboratory courses

Course Code	***Course Title***	***Experiment No***	***Course Outcomes***	
EC605	Microprocessors and Microcontrollers Lab	1,2,3 (Part-I)	CO1	Apply the fundamentals of assembly level programming of microprocessors.
		5 (Part-I)	CO2	Build a program on a microprocessor using instruction set of 8086.
		4 (Part-I)	CO3	Analyze the working of 8255, 8279, 8259 and 8251 interfacing with 8086 processor and develop the programs.
		1,2,3,4 (Part-II, IV)	CO4	Analyze the working of 8051 internal peripherals.
		1,2,3 (Part-III)	CO5	Model the interfacing of 8051 with external peripherals like 7 segment display, LCD, ADC and DAC.
EC606	Digital Communications Lab	2,3,4	CO1	Demonstrate various pulse digital modulation techniques such as Pulse code modulation and Differential PCM.
		1	CO2	Identify the need for time division multiplexing.
		5,6,7,8	CO3	Analyze various digital modulation techniques like PSK,FSK.
		9	CO4	Design various error control coding techniques.
		10,11,12	CO5	Apply suitable modulation schemes and coding for various

				applications.
EC607	Digital Signal Processing Lab	1-10	CO1	Apply DSP tools such as Matlab and Code Composer Studio to analyze discrete systems and design digital filters.
		2,3,5,10	CO2	Demonstrate the concepts of linear convolution, circular convolution and their relationship and fast Fourier transform.
		8,9	CO3	Analyze and Develop basic FIR and IIR digital filters.
		4,6	CO4	Experiment with tools like power spectral density and Fourier series.
		1	CO5	Understand the basic knowledge and working of trainer kit TMS320C6713 DSP Processors.

7th Semester

Theory courses

Course Code	*Course Title*	*Course Outcomes*	
EC701	VLSI Design	CO1	Understand the various fabrications steps of IC and come across basic electrical properties of MOSFET.
		CO2	Apply the concept of design rules during the layout of a circuit.
		CO3	Make use of the basic circuit concepts of MOS Devices to understand the effect of scaling on device parameters.
		CO4	Outline the System considerations and general considerations of subsystem design processes.
		CO5	Summarize the VLSI Design issues on power calculations, clock mechanisms and mixed signal design.
		CO6	Understand FPGA design implementation process and implement design examples like Stack, Queue and Shift register using VHDL.
CS708	Computer Networks	CO1	Understand the classification of reference models with examples of computer networks.
		CO2	Utilize the transmission media in transferring the data from one network to another.
		CO3	Make use of CRC and Hamming code concepts for error detection and corrections and further contrast data link protocols for data rate.
		CO4	Relate and Choose routing algorithms for accurate data transmission and congestion control.
		CO5	Analyze transport layer protocols and services for connection management.
		CO6	Assess the network security and configure the application layer protocols and services.
EC702	Digital Image Processing	CO1	Understand the fundamental concepts and applications of Digital Image Processing and apply different transforms on images useful for image processing applications.
		CO2	Apply spatial and frequency domain filtering on images and analyze the relationship between filtering in spatial and frequency domains.
		CO3	Evaluate different Image restoration and reconstruction techniques.
		CO4	Analyze different color models and color conversions in color image processing.
		CO5	Analyze different Image compression and Watermarking techniques and outline the concepts of Wavelets and multi-resolution processing.
		CO6	Understand different morphological operations and image segmentation techniques.
CS709	Computer	CO1	Outline the architecture, the performance measurement of a modern

	Architecture & Organization		computer and Make use of the algorithms related to fixed-point and floating-point arithmetic.
		CO2	Extend the knowledge of registers, instructions and addressing modes in understanding the architecture of a digital computer.
		CO3	Summarize the Micro Programmed Control unit.
		CO4	Classify cache memories, Auxiliary, Associative and virtual memory in hierarchical memory system.
		CO5	Compare and Contrast different methods for computer I/O.
		CO6	Classify various methods of pipelining, vector processing, parallel processing and multiprocessors.
EC7EC	Radar Systems (Elective I)	CO1	Understand and identify the basics and the usage of frequencies in radars to use them in wars.
		CO2	Classify the Radars on the basis of their functioning and extracting the target parameters
		CO3	Apply the concept of Doppler effect in MTI & PDRs and utilize radar in tracking targets by estimating the error signals in the case of servo systems.
		CO4	Compare & Contrast the various techniques involved in tracking the targets and further understand the various antennas used in radars.
		CO5	Utilize the phased array radars to analyze the processes of detection of signals in presence of noise and clutter.
		CO6	Assess the advantages and limitations of different feeds of the various antennas and know the functioning of different types of duplexers and displays.
EC7ED	Optical Communication (Elective II)	CO1	Understand the evolution, basic working principle and choose the necessary components required for fibre optic communication systems.
		CO2	Relate the measurement of optical fibre losses like attenuation etc to various propagating modes
		CO3	Choose appropriate connectors and/or splices for jointing optical fibres.
		CO4	Understand the working of different double and multilayered hetero structured Optical sources and detectors, design transmitter and receiver subsystems and evaluate their performance characteristics.
		CO5	Choose the appropriate required components for the point to point / multipoint links based on specifications.
		CO6	Make use of principles of the Wavelength Division Multiplexing in High speed optical communication systems.

Laboratory Courses

Course Code	*Course Title*	*Experiment No*	*Course Outcomes*	
EC704	V L S I Lab	1-10	CO1	Determine the work flow of Mentor Pyxis Schematic tools for digital design through experimentation.
		1-10	CO2	Determine the workflow to draw the layout using Mentor Graphics CAD tool through experimentation.
		1-10	CO3	Develop transistor level design and layout in Mentor Pyxis Schematic editor.
		1-10	CO4	Draw the schematic and verify AC, DC and Transient analysis for different applications with given specifications.
		1,2	CO5	Verify the design by drawing Layout and verify the DRC,

				Check for LVS and Extract parasites for different applications.
EC705	Microwave Engineering Lab	1,2,6,7	CO1	Determine the necessary characteristics of microwave signals through experimentation.
		6,7	CO2	Use a microwave test bench in analyzing various types of microwave measurements.
		4,8,9	CO3	Analyze various characteristics of microwave junctions.
		13,14,15	CO4	Measure optical parameters and losses using optical link system.
		10	CO5	Plot the loss characteristics of optical fibres.

8th Semester

Course Code	*Course Title*	*Course Outcomes*	
EC801	Cellular Mobile Communication	CO1	Summarize the limitations of conventional mobile telephone systems and to explain the concepts of cellular systems.
		CO2	Distinguish the different types of interferences, develop antenna system and list various propagation effects in cellular environment.
		CO3	Examine the different types of antennas used at cell site and mobile stations.
		CO4	Explain frequency management, channel assignment used in cellular systems.
		CO5	Analyze the concept of handoff and compare the handoff techniques.
		CO6	Explain the architecture of GSM and 3G cellular systems, explain how can multiple access techniques can be used to improve cellular networks.
EC802	Electronic Measurements and Instrumentation	CO1	Understand the different characteristics of electronic measuring instruments.
		CO2	Make use of Signal generators to analyze a signal.
		CO3	Understand the design and functioning of Oscilloscopes.
		CO4	Utilize AC bridges for measurement of inductance.
		CO5	Distinguish active transducers from passive transducers.
		CO6	Develop the ability to use instruments for measurement of physical parameters.
EC8EA	Satellite Communication (Elective III)	CO1	Explain the basics of satellite communication and Able to obtain different types of satellites.
		CO2	Outline the fundamentals of orbital mechanics, identify the characteristics of common orbits used by communications and other satellites, and assess launch methods and technologies.
		CO3	Demonstrate the systems required by a communications satellite to function and the trade-offs and limitations encountered in the design of a communications satellite system.
		CO4	How to design both up-link and down link and Able to calculate multiple access techniques like TDMA, FDMA and CDMA.
		CO5	Explain Earth station Technology and Ability to demonstrate the LEO and GEO – stationary satellite systems.
		CO6	Explain satellite navigation and the global positioning system.
EC8EG	Low Power IC Design (Elective IV)	CO1	Illustrate the necessity of low power VLSI, Sources of power dissipation techniques and importance of Short-Channel effects.
		CO2	Explain the concepts of Low-Power Design Approaches.
		CO3	Outline the power analysis and make use of simulators to observe power for different Low Power VLSI Circuits.

		CO4	Analyze Low-Voltage Low-Power Adder Circuits.
		CO5	Apply Low Power Design concept to Different Multiplier circuits.
		CO6	Classify and Compare Low-Voltage Low-Power Memories.
GW8PA	Project & Seminar	CO1	Demonstrate the technical knowledge to identify problems in the field of Electronics & Communication Engineering and its allied areas.
		CO2	Analyze and formulate technical projects with a comprehensive and systematic approach.
		CO3	Identify the modern tools to implement technical projects.
		CO4	Design engineering solutions for solving complex engineering problems.
		CO5	Develop effective communication skills, professional behaviour and team work.

To map Course Outcomes (COs) with Program Outcomes (POs)/ Program Specific Outcomes (PSOs), the correlation matrix given below is used to find the courses are representing each POs/PSOs.

Correlation matrix

Engineering graduate will be able to

PO#	Key Elements
PO-1	1. Apply knowledge of Mathematics and Science 2. Apply knowledge of Engineering fundamentals 3. Apply knowledge of Electronics and Communication Engineering fundamentals
PO-2	1. Apply research literature review 2. Identify and formulate complex problems in the area of ECE 3. Analyze and reaching substantiated conclusions using principles of mathematics 4. Reaching substantiated conclusions using engineering sciences
PO-3	1. Design and develop the system components & processes considering public health and safety. 2. Design and develop the system components & processes to meet the needs of society. 3. Design and develop the system components & processes by considering environmental issues.
PO-4	1. Conduct and explore the theoretical investigations in laboratories. 2. Analyze, interpret and validate the investigations of problems. 3. Apply the domain knowledge to validate experiments and projects.
PO-5	1. Select modern IT tools for understanding the complex engineering concepts. 2. Apply the modern IT tools for simulating the complex problems. 3. Apply the techniques, resources and modern engineering tools for the scope of understanding.
PO-6	1. Apply contextual knowledge towards health and safety of the society. 2. Demonstrate engineering skills towards legal and cultural issues.
PO-7	1. Overview and reduce the adverse effects by providing suitable engineering solutions for environment and societal problems.

	2. Demonstrate the engineering knowledge for sustainable development.
PO-8	1. Apply engineering norms with professional ethics. 2. Accountable and responsible in exhibiting engineering skills.
PO-9	1. Implicate team work and leadership qualities.
PO-10	1. Effective reports writing skills. 2. Effective presentation skills to give and receive clear instructions.
PO-11	1. Apply managerial skills in understanding demonstrating the engineering activities in multi disciplinary environment. 2. Effective functional planning and implementation in handling the project
PO-12	1. Develop the real for self learning modern technologies 2. Engage themselves in lifelong learning for technology changes
PSO-1	1. Understand the concepts for the design of electronics and communication systems 2. Analyze and apply knowledge acquired in designing ECE system
PSO-2	1. Design and simulation of ECE essential modules in the area of ECE 2. Hardware implementation of validation of essential modules in the area of ECE

Mapping of Course Outcomes (COs) with Program Outcomes (POs)/ Program Specific Outcomes (PSOs)

1st Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
SH101	CO1	-	-	-	-	-	1	-	-	2	1	-	-	-	-
	CO2	-	-	-	-	-	1	-	-	1	1	-	-	-	-
	CO3	-	-	-	-	-	1	-	-	-	1	-	-	-	-
	CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-
	CO5	-	-	-	-	-	1	-	-	2	1	-	-	-	-
	CO6	-	-	-	-	-	1	-	-	1	1	-	-	-	-
	Avg	-	-	-	-	-	**1**	-	-	**1.5**	**1.33**	-	-	-	-
SH102	CO1	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO2	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO3	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO4	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO5	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO6	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	Avg	**3**	**2**	-	-	**2**	-	-	-	-	-	**2**	**2**	-	**1**
SH103	CO1	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO2	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO3	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO4	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO5	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO6	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	Avg	**3**	**2**	-	-	**2**	-	-	-	-	-	**2**	**2**	-	**1**
SH104	CO1	3	1	-	1	-	-	-	-	-	-	-	-	-	-
	CO2	3	1	-	1	-	-	-	-	-	-	-	-	-	-
	CO3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
	CO4	3	3	1	2	-	-	-	-	-	-	-	-	-	-
	CO5	3	1	1	1	-	-	-	-	-	-	-	-	-	-

	CO6	3	2	1	2	-	-	-	-	-	-	-	-	-	-
	Avg	**3**	**1.67**	**1**	**1.33**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SH105	CO1	-	-	-	-	-	1	1	3	2	-	1	1	-	-
	CO2	-	-	-	-	-	1	1	3	2	-	1	1	-	-
	CO3	-	-	1	-	-	1	2	3	2	-	1	1	-	-
	CO4	-	-	1	-	-	2	2	3	2	-	1	1	-	-
	CO5	-	-	-	-	-	1	1	3	2	-	1	1	-	-
	CO6	-	-	1	-	-	1	2	3	2	-	1	1	-	-
	Avg	**-**	**-**	**1**	**-**	**-**	**1.17**	**1.5**	**3**	**2**	**-**	**1**	**1**	**-**	**-**
SH106	CO1	2	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO3	2	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO4	2	1	2	-	-	-	-	-	-	-	-	-	-	-
	CO5	2	1	2	-	-	-	-	-	-	-	-	-	-	-
	CO6	2	1	2	-	-	-	-	-	-	-	-	-	-	-
	Avg	**2**	**1**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SH107	CO1	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
	CO3	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	CO4	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	CO5	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	Avg	-	-	-	-	-	-	-	-	-	**2.2**	-	-	-	-
SH108	CO1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO2	1	1	1	1	-	-	-	-	-	-	-	-	-	-
	CO3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO4	3	1	1	1	-	-	-	-	-	-	-	-	-	-
	CO5	3	1	1	1	-	-	-	-	-	-	-	-	-	-
	Avg	**1.8**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SH109	CO1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	CO2	1	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO3	1	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO4	-	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO5	-	1	1	1	2	-	-	-	-	-	-	-	-	-
	Avg	**1**	**1**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SH110	CO1	1	-	-	-	1	-	-	-	-	-	-	1	-	-
	CO2	1	-	-	-	1	-	-	-	-	-	-	1	-	-
	CO3	1	-	-	-	-	-	-	-	-	1	-	1	-	-
	Avg	**1**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**

2nd Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
SH201	CO1	-	-	-	-	-	3	-	-	1	2	-	-	-	-
	CO2	-	-	-	-	-	2	-	-	1	2	-	-	-	-
	CO3	-	-	-	-	-	3	-	-	-	2	-	-	-	-
	CO4	-	-	-	-	-	2	-	-	-	2	-	-	-	-
	CO5	-	-	-	-	-	-	-	-	2	1	-	-	-	-
	CO6	-	-	-	-	-	-	-	-	2	1	-	-	-	-
	Avg	**-**	**-**	**-**	**-**	**-**	**2.5**	**-**	**-**	**1.5**	**1.67**	**-**	**-**	**-**	**-**
SH202	CO1	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO2	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO3	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO4	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO5	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	CO6	3	2	-	-	2	-	-	-	-	-	2	2	-	1
	Avg	**3**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**1**

SH203	CO1	1	1	-	-	-	1	1	1	-	-	-	-	-	-
	CO2	1	1	-	-	-	2	1	-	-	-	-	-	-	-
	CO3	2	1	1	-	-	1	2	-	-	-	-	-	-	-
	CO4	2	-	-	-	-	1	1	1	-	-	-	-	-	-
	CO5	2	1	-	-	-	2	1	-	-	-	-	-	-	-
	CO6	1	1	1	-	-	1	2	1	-	-	-	-	-	-
	Avg	**1.5**	**1**	**1**	**-**	**-**	**1.33**	**1.33**	**1**	**-**	**-**	**-**	**-**	**-**	**-**
SH204	CO1	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	CO2	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	CO3	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	CO6	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	Avg	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CS201	CO1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
	CO3	2	2	1	-	-	-	-	-	-	-	-	2	-	2
	CO4	1	2	1	-	-	-	-	-	-	-	-	2	-	2
	CO5	1	2	1	-	-	-	-	-	-	-	-	1	-	1
	CO6	-	2	1	-	-	-	-	-	-	-	-	1	-	1
	Avg	**1.4**	**1.67**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.5**	**-**	**1.5**
EE202	CO1	3	2	2	-	-	-	-	-	-	-	-	2	1	2
	CO2	3	1	1	-	-	-	-	-	-	-	-	2	1	2
	CO3	3	1	1	-	-	-	-	-	-	-	-	2	1	1
	CO4	3	2	2	-	-	-	-	-	-	-	-	2	1	2
	CO5	3	2	1	-	-	-	-	-	-	-	-	2	1	1
	CO6	3	2	1	-	-	-	-	-	-	-	-	2	1	2
	Avg	**3**	**1.67**	**1.33**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**1.67**
SH205	CO1	1	-	-	2	-	1	-	-	-	-	-	-	-	-
	CO2	1	1	1	-	-	1	1	-	-	-	-	-	-	-
	CO3	1	1	1	1	-	1	1	-	-	-	-	-	-	-
	CO4	1	1	1	1	1	1	-	-	-	-	-	-	-	-
	CO5	1	1	1	-	-	1	1	-	-	-	-	-	-	-
	Avg	**1**	**1**	**1**	**1.33**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SH206	CO1	-	-	-	-	-	-	-	-	1	2	-	-	-	-
	CO2	-	-	-	-	-	-	-	-	1	2	-	-	-	-
	CO3	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	CO4	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	CO5	-	-	-	-	-	-	-	-	-	3	-	-	-	-
	Avg	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2.2**	**-**	**-**	**-**	**-**
CS202	CO1	-	-	-	1	1	-	-	-	-	-	-	-	-	1
	CO2	1	-	-	1	2	-	-	-	-	-	-	-	-	1
	CO3	1	-	-	1	2	-	-	-	-	-	-	-	-	2
	CO4	1	-	-	1	2	-	-	-	-	-	-	-	-	2
	CO5	1	-	-	1	2	-	-	-	-	-	-	-	-	1
	Avg	**1**	**-**	**-**	**1**	**1.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.4**

3rd Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
SH302	CO1	-	-	-	-	-	-	-	1	2	-	1	3	-	-
	CO2	-	-	-	-	-	-	-	-	-	1	2	3	-	-
	CO3	-	-	-	-	-	-	-	-	1	2	1	3	-	-
	CO4	-	-	-	-	-	-	-	-	-	1	3	3	-	-
	CO5	-	-	-	-	-	-	-	-	1	1	2	3	-	-
	CO6	-	-	-	-	-	-	-	-	-	-	2	3	-	-
	Avg	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1.33**	**1.25**	**1.83**	**3**	**-**	**-**

EC301	CO1	2	2	-	-	-	-	-	-	-	-	-	2	1	1
	CO2	2	2	1	1	-	-	-	-	-	-	-	1	2	1
	CO3	2	2	-	1	-	-	-	-	-	-	-	1	1	1
	CO4	2	2	-	2	-	-	-	-	-	-	-	2	2	1
	CO5	1	2	-	1	-	-	-	-	-	-	-	1	2	1
	CO6	2	2	-	2	-	-	-	-	-	-	-	2	2	1
	Avg	**1.83**	**2**	**1**	**1.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.5**	**1.67**	**1**
CS302	CO1	2	2	1	1	1	-	-	-	-	-	-	-	2	2
	CO2	2	1	1	1	1	-	-	-	-	-	-	-	2	2
	CO3	1	-	-	-	1	-	-	-	-	-	-	-	-	-
	CO4	1	-	-	-	1	-	-	-	-	-	-	-	-	-
	CO5	1	-	-	-	1	-	-	-	-	-	-	-	-	-
	CO6	2	2	1	1	1	-	-	-	-	-	-	-	2	2
	Avg	**1.5**	**1.67**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
SH303	CO1	-	-	1	-	-	2	3	2	-	-	-	-	-	-
	CO2	-	-	-	-	-	1	2	2	-	-	-	-	-	-
	CO3	-	-	-	-	-	1	1	1	-	-	-	-	-	-
	CO4	-	-	1	-	-	2	3	2	-	-	-	-	-	-
	CO5	-	-	-	-	-	2	3	2	-	-	-	-	-	-
	CO6	-	-	1	-	-	2	3	2	-	-	-	-	-	-
	Avg	**-**	**-**	**1**	**-**	**-**	**1.67**	**2.5**	**1.83**	**-**	**-**	**-**	**-**	**-**	**-**
EC302	CO1	2	2	1	-	2	-	-	-	-	-	-	2	3	1
	CO2	2	3	2	-	2	-	-	-	-	-	-	3	3	2
	CO3	2	3	2	-	2	-	-	-	-	-	-	3	3	2
	CO4	2	3	2	-	2	-	-	-	-	-	-	2	3	2
	CO5	2	3	2	-	1	-	-	-	-	-	-	2	2	2
	CO6	2	3	2	-	1	-	-	-	-	-	-	2	3	3
	Avg	**2**	**2.83**	**1.83**	**-**	**1.67**	**-**	**-**	**-**	**-**	**-**	**-**	**2.33**	**2.83**	**2**
EE305	CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO3	2	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO4	2	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO5	2	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO6	2	2	-	-	-	-	-	-	-	-	-	-	1	2
	Avg	**2**	**1.17**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**
EC303	CO1	1	1	-	3	-	-	-	-	-	-	-	1	1	2
	CO2	1	1	-	3	-	-	-	-	-	-	-	1	1	2
	CO3	1	1	-	3	-	-	-	-	-	-	-	1	1	2
	CO4	1	1	-	3	-	-	-	-	-	-	-	1	1	3
	CO5	1	1	-	3	-	-	-	-	-	-	-	1	1	3
	Avg	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**2.4**
EE306	CO1	3	3	-	2	-	-	-	-	-	-	-	-	1	-
	CO2	3	2	-	2	-	-	-	-	-	-	-	-	1	-
	CO3	3	2	-	2	-	-	-	-	-	-	-	-	1	-
	CO4	3	2	-	2	-	-	-	-	-	-	-	-	1	-
	CO5	3	2	-	2	-	-	-	-	-	-	-	-	1	-
	Avg	**3**	**2.2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

4th Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
EC401	CO1	2	1	-	1	-	-	-	-	-	-	-	1	2	1
	CO2	2	2	1	2	-	-	-	-	-	-	-	1	2	2
	CO3	2	2	1	2	-	-	-	-	-	-	-	1	1	2
	CO4	2	2	1		-	-	-	-	-	-	-	1	1	2

	CO5	2	1	-	1	-	1	-	-	-	-	-	1	2	1
	CO6	2	2	-	1	-	1	-	-	-	-	-	1	2	2
	Avg	**2**	**1.67**	**1**	**1.4**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**1.67**	**1.67**
SH402	CO1	-	2	-	-	-	1	2	-	3	2	2	3	-	-
	CO2	2	-	-	-	-	-	2	-	3	-	-	3	-	-
	CO3	-	-	-	-	-	-	1	-	3	2	2	3	-	-
	CO4	-	-	-	-	-	-	-	-	3	1	3	3	-	-
	CO5	-	-	-	-	-	-	-	-	2	2	3	3	-	-
	CO6	-	-	-	-	-	-	-	-	1	2	3	3	-	-
	Avg	**2**	**2**	**-**	**-**	**-**	**1**	**1.67**	**-**	**2.5**	**1.8**	**2.6**	**3**	**-**	**-**
EC402	CO1	2	2	-	-	-	1	-	-	-	-	-	2	2	1
	CO2	2	2	-	-	-	1	-	-	-	-	-	2	2	1
	CO3	2	2	-	-	-	-	-	-	-	-	-	2	2	1
	CO4	1	2	-	-	-	-	-	-	-	-	-	2	2	1
	CO5	2	2	-	-	-	-	-	-	-	-	-	1	2	2
	CO6	2	3	1	-	-	-	-	-	-	-	-	3	3	3
	Avg	**1.83**	**2.17**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**2.17**	**1.5**
EC403	CO1	2	-	-	-	-	-	-	-	-	-	-	-	1	1
	CO2	1	2	1	-	-	-	-	-	-	-	-	-	2	1
	CO3	-	-	3	-	-	-	-	-	-	-	-	-	2	2
	CO4	-	-	2	-	-	-	-	-	-	-	-	2	1	2
	CO5	-	2	2	-	-	-	-	-	-	-	-	1	2	3
	CO6	-	1	2	-	-	-	-	-	-	-	-	2	1	3
	Avg	**1.5**	**1.67**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.67**	**1.5**	**2**
EC404	CO1	1	1	-	-	-	-	-	-	-	-	-	2	3	1
	CO2	1	3	1	-	-	-	-	-	-	-	-	3	2	1
	CO3	2	2	2	-	-	-	-	-	-	-	-	3	2	2
	CO4	2	2	2	-	-	-	-	-	-	-	-	3	2	2
	CO5	1	1	1	-	-	-	-	-	-	-	-	2	2	1
	CO6	1	2	2	-	-	-	-	-	-	-	-	2	1	2
	Avg	**1.33**	**1.83**	**1.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.5**	**2**	**1.5**
EC405	CO1	1	2	1	-	-	-	-	-	-	-	-	1	2	1
	CO2	2	2	2	-	-		-	-	-	-	-	1	2	2
	CO3	1	2	1	-	-	-	-	-	-	-	-	1	2	1
	CO4	2	2	2	-	-	-	-	-	-	-	-	2	1	2
	CO5	2	2	2	-	-	-	-	-	-	-	-	1	2	2
	CO6	1	2	1	-	-	-	-	-	-	-	-	1	2	1
	Avg	**1.5**	**2**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.17**	**1.83**	**1.5**
EC406	CO1	1	1	-	3	2	-	-	-	-	-	-	-	1	3
	CO2	1	1	-	3	2	-	-	-	-	-	-	-	1	3
	CO3	1	1	-	3	2	-	-	-	-	-	-	-	1	3
	CO4	1	1	-	3	2	-	-	-	-	-	-	-	1	3
	CO5	1	1	-	3	2	-	-	-	-	-	-	-	1	3
	Avg	**1**	**1**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**
EC407	CO1	1	1	-	3	2	-	-	-	-	-	-	1	1	2
	CO2	1	1	-	3	2	-	-	-	-	-	-	1	1	2
	CO3	1	1	-	3	2	-	-	-	-	-	-	1	1	2
	CO4	1	1	-	3	2	-	-	-	-	-	-	1	1	3
	CO5	1	1	-	3	2	-	-	-	-	-	-	1	1	3
	Avg	**1**	**1**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**2.4**

5th Semester

Course Outcomes		*Program Outcomes (POs) and Program Specific Outcomes (PSOs)*													
		PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO 11***	***PO 12***	***PSO1***	***PSO2***
EC501	CO1	2	3	3	-	-	-	-	-	-	-	-	2	3	2

	CO2	2	2	3	-	-	-	-	-	-	-	-	1	2	1
	CO3	2	3	3	-	-	-	-	-	-	-	-	1	2	1
	CO4	2	3	3	-	-	-	-	-	-	-	-	1	3	2
	CO5	2	2	1	-	-	-	-	-	-	-	-	1	1	1
	CO6	1	1	1	-	-	-	-	-	-	-	-	2	2	2
	Avg	**1.83**	**2.33**	**2.33**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.33**	**2.17**	**1.5**
EC502	CO1	3	2	2	-	-	-	-	-	-	-	-	1	2	2
	CO2	1	1	1	-	-	-	-	-	-	-	-	1	1	1
	CO3	2	3	2	-	-	-	-	-	-	-	-	2	2	2
	CO4	3	3	3	-	-	-	-	-	-	-	-	2	2	3
	CO5	2	2	2	-	-	-	-	-	-	-	-	2	2	2
	CO6	1	2	2	-	-	-	-	-	-	-	-	1	1	1
	Avg	**2**	**2.17**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.5**	**1.67**	**1.83**
EE507	CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-
	CO2	3	-	-	-	-	-	-	-	-	-	-	-	3	-
	CO3	-	3	-	-	-	-	-	-	-	-	-	-	3	-
	CO4	-	3	-	-	-	-	-	-	-	-	-	-	3	-
	CO5	3	2	2	-	-	-	-	-	-	-	-	-	3	-
	CO6	3	2	-	-	-	-	-	-	-	-	-	-	3	2
	Avg	**3**	**2.5**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**
EC503	CO1	1	1	-	-	3	-	-	-	-	-	-	2	2	3
	CO2	1	1	-	-	3	-	-	-	-	-	-	2	2	3
	CO3	1	2	-	-	-	-	-	-	-	-	-	1	2	2
	CO4	2	2	-	-	-	-	-	-	-	-	-	2	2	2
	CO5	1	2	-	2	-	-	-	-	-	-	-	1	1	3
	CO6	1	2	-	-	-	-	-	-	-	-	-	1	1	3
	Avg	**1.17**	**1.67**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1.5**	**1.67**	**2.67**
EC504	CO1	1	2	1	-	-	-	-	-	-	-	-	2	3	2
	CO2	3	3	2	-	-	-	-	-	-	-	-	2	2	2
	CO3	2	3	2	-	-	-	-	-	-	-	-	3	2	3
	CO4	2	3	2	-	-	-	-	-	-	-	-	3	2	3
	CO5	1	2	1	-	-	-	-	-	-	-	-	1	2	3
	CO6	-	1	-	-	-	-	2	-	-	-	-	1	1	1
	Avg	**1.8**	**2.33**	**1.6**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**2.33**
EC505	CO1	2	3	3	-	1	2	-	-	-	-	-	2	3	3
	CO2	2	1	-	-	1	2	-	-	-	-	-	2	2	2
	CO3	2	3	3	-	1	2	-	-	-	-	-	2	3	3
	CO4	2	1	1	-	-	1	-	-	-	-	-	1	1	2
	CO5	2	1	1	-	-	1	-	-	-	-	-	2	3	3
	Avg	**2**	**1.8**	**2**	**-**	**1**	**1.6**	**-**	**-**	**-**	**-**	**-**	**1.8**	**2.4**	**2.6**
EC506	CO1	1	1	-	3	2	-	-	-	-	-	-	2	2	3
	CO2	1	1	-	3	2	-	-	-	-	-	-	2	1	3
	CO3	1	1	-	3	2	-	-	-	-	-	-	2	2	3
	CO4	1	1	-	3	2	-	-	-	-	-	-	2	2	3
	CO5	1	1	-	3	2	-	-	-	-	-	-	2	1	3
	Avg	**1**	**1**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.6**	**3**
EC507	CO1	-	-	-	3	3	-	-	-	-	-	-	2	2	2
	CO2	-	-	-	3	3	-	-	-	-	-	-	2	1	3
	CO3	-	-	-	2	3	-	-	-	-	-	-	2	2	1
	CO4	-	-	-	1	3	-	-	-	-	-	-	2	2	1
	CO5	-	-	-	3	3	-	-	-	-	-	-	2	1	3
	Avg	**-**	**-**	**-**	**2.4**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.6**	**2**
SH502	CO1	-	-	1	-	-	2	1	1	2	-	2	1	-	-
	CO2	-	-	1	-	-	2	2	1	2	-	2	2	-	-
	CO3	-	-	1	-	-	2	1	1	2	-	1	2	-	-
	CO4	-	-	1	-	-	2	1	1	2	-	2	1	-	-

	CO5	-	-	1	-	-	1	1	1	1	-	1	1	-	-
	CO6	-	-	1	-	-	2	1	1	2	-	2	2	-	-
	Avg	-	-	**1**	-	-	**1.83**	**1.17**	**1**	**1.83**	-	**1.67**	**1.5**	-	-

6th Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
EC601	CO1	1	-	-	-	-	-	-	-	-	-	-	-	2	1
	CO2	1	1	-	-	2	-	-	-	-	-	-	-	2	1
	CO3	-	2	2	-	-	-	-	-	-	-	-	-	1	2
	CO4	1	-	-	-	-	-	-	-	-	-	-	-	2	1
	CO5	2	-	3	-	2	2	-	-	-	-	-	2	1	3
	CO6	-	-	-	1	-	-	-	-	-	-	-	2	2	1
	Avg	**1.25**	**1.5**	**2.5**	**1**	**2**	**2**	-	-	-	-	-	**2**	**1.67**	**1.5**
EC602	CO1	3	3	1	-	-	1	-	-	-	-	-	1	3	-
	CO2	3	3	1	-	-	1	-	-	-	-	-	1	3	2
	CO3	3	3	2	-	-	1	-	-	-	-	-	1	2	3
	CO4	2	2	3	-	-	3	-	-	-	-	-	3	1	3
	CO5	2	2	3	-	-	3	-	-	-	-	-	3	3	3
	CO6	1	-	-	-	-	3	-	-	-	-	-	2	3	1
	Avg	**2.33**	**2.6**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**1.83**	**2.5**	**2.4**
EC603	CO1	2	1	1	1	-	2	-	-	-	-	-	1	2	2
	CO2	2	3	2	2	-	2	-	-	-	-	-	1	2	2
	CO3	2	3	2	2	-	2	-	-	-	-	-	1	2	3
	CO4	2	3	3	2	-	2	-	-	-	-	-	2	2	3
	CO5	2	2	3	2	-	2	-	-	-	-	-	2	2	3
	CO6	2	2	3	3	-	2	-	-	-	-	-	3	2	3
	Avg	**2**	**2.33**	**2.33**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**1.67**	**2**	**2.67**
EC604	CO1	2	2	1	-	-	1	-	-	-	-	-	1	1	2
	CO2	2	2	-	-	2	-	-	-	-	-	-	2	1	2
	CO3	1	1	-	2	-	-	-	-	-	-	-	1	1	1
	CO4	1	1	-	-	-	2	-	-	-	-	-	1	1	2
	CO5	1	2	2	1	-	-	-	-	-	-	-	1	1	2
	CO6	1	2	-	-	2	2	-	-	-	-	-	2	1	3
	Avg	**1.33**	**1.67**	**1.5**	**1.5**	**2**	**1.67**	**-**	**-**	**-**	**-**	**-**	**1.33**	**1**	**2**
EC6OA	CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	-
	CO2	-	2	-	-	-	-	-	-	-	-	-	-	3	-
	CO3	-	-	3	-	-	-	-	-	-	-	-	-	-	3
	CO4	-	-	3	-	-	-	-	-	-	-	-	-	-	3
	CO5	-	-	-	-	-	2	-	-	-	-	-	-	-	3
	CO6	-	-	-	-	-	2	-	-	-	-	-	-	-	3
	Avg	**3**	**2**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2.5**	**3**
EC605	CO1	1	1	1	2	2	-	-	-	1	-	-	-	2	1
	CO2	1	1	2	2	2	-	-	-	2	-	-	-	2	1
	CO3	1	1	1	2	2	-	-	-	2	-	-	-	2	1
	CO4	1	2	2	2	3	-	-	-	2	-	1	2	2	2
	CO5	1	2	2	2	3	-	-	-	2	-	1	2	2	2
	Avg	**1**	**1.4**	**1.6**	**2**	**2.4**	**-**	**-**	**-**	**1.8**	**-**	**1**	**2**	**2**	**1.4**
EC606	CO1	1	2	2	3	-	-	-	-	2	2	1	-	2	2
	CO2	1	2	2	3	-	-	-	-	2	2	1	-	2	2
	CO3	2	2	2	3	-	-	-	-	2	2	1	-	2	3
	CO4	2	2	3	3	-	-	-	-	2	2	1	-	2	3
	CO5	2	2	3	3	-	-	-	-	2	2	1	-	2	3
	Avg	**1.6**	**2**	**2.4**	**3**	**-**	**-**	**-**	**-**	**2**	**2**	**1**	**-**	**2**	**2.6**
EC607	CO1	2	3	1	3	3	-	-	-	-	-	-	2	3	3

	CO2	3	1	1	3	3	-	-	-	-	-	-	2	3	3
	CO3	3	3	2	3	3	-	-	-	-	-	-	2	3	3
	CO4	3	3	2	2	3	-	-	-	-	-	-	2	3	2
	CO5	1	1	1	2	3	-	-	-	-	-	-	2	2	2
	Avg	**2.4**	**2.2**	**1.4**	**2.6**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2.8**	**2.6**
GW6SA	CO1	3	2	-	-	-	-	-	-	-	-	-	-	2	-
	CO2	-	-	-	-	-	-	-	2	1	3	1	1	-	-
	CO3	-	-	-	-	-	-	-	-	1		2	3	2	-
	CO4	-	2	-	-	-	-	-	3	-	-	-	1	2	-
	CO5	-	-	-	-	-	-	-	-	-	3	-	1	-	-
	Avg	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2.5**	**1**	**3**	**1.5**	**1.5**	**2**	**-**

7th Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
EC701	CO1	2	2	2	-	-	-	-	-	-	-	-	1	2	2
	CO2	-	2	2	-	-	-	-	-	-	-	-	2	2	3
	CO3	2	2	2	-	-	-	-	-	-	-	-	1	3	1
	CO4	-	2	2	-	-	-	-	-	-	-	-	1	2	3
	CO5	-	1	-	-	-	-	-	-	-	-	-	1	2	1
	CO6	-	2	2	-	-	-	-	-	-	-	-	1	2	2
	Avg	**2**	**1.83**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.17**	**2.17**	**2**
CS708	CO1	-	-	2	-	-	-	-	-	-	-	-	-	-	1
	CO2	1	-	2	-	-	-	-	-	-	-	-	-	-	2
	CO3	3	2	3	2	-	-	-	-	-	-	-	2	-	1
	CO4	2	3	3	2	-	-	-	-	-	-	-	3	-	2
	CO5	2	-	2	-	-	-	-	-	-	-	-	2	-	2
	CO6	2	2	2	1	-	-	-	-	-	-	-	3	-	2
	Avg	**2**	**2.33**	**2.33**	**1.67**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.5**	**-**	**1.67**
EC702	CO1	3	3	1	-	-	-	-	-	-	-	-	2	3	1
	CO2	3	3	2	-	-	2	-	-	-	-	-	2	3	2
	CO3	3	3	2	-	-	2	-	-	-	-	-	3	3	3
	CO4	3	2	2	-	-	2	-	-	-	-	-	3	2	2
	CO5	3	3	3	-	-	3	-	-	-	-	-	2	3	3
	CO6	3	2	2	-	-	2	-	-	-	-	-	1	2	3
	Avg	**3**	**2.67**	**2**	**-**	**-**	**2.2**	**-**	**-**	**-**	**-**	**-**	**2.17**	**2.67**	2.33
CS709	CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO2	1	2	-	-	-	-	-	-	-	-	-	-	2	-
	CO3	-	1	-	-	-	-	-	-	-	-	-	-	1	-
	CO4	-	1	-	-	-	-	-	-	-	-	-	1	1	-
	CO5	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	CO6	2	2	-	-	-	-	-	-	-	-	-	1	-	-
	Avg	**1.67**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1.25**	**-**
EC7EC	CO1	2	-	1	-	-	-	-	-	-	-	-	1	3	1
	CO2	2	3	2	-	-	-	-	-	-	-	-	2	3	2
	CO3	2	2	1	-	-	-	-	-	-	-	-	2	3	3
	CO4	2	1	1	-	-	-	-		-	-	-	1	3	2
	CO5	2	2	1	-	-	-	-	-	-	-	-	1	3	3
	CO6	2	2	1	-	-	-	-	-	-	-	-	1	3	2
	Avg	**2**	**2**	**1.17**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.33**	**3**	**2.17**
EC7ED	CO1	3	2	1	-	-	-	-	-	-	-	-	2	3	1
	CO2	2	2	1	2	-	-	-	-	-	-	-	2	3	2
	CO3	2	2	1	3	-	-	-	-	-	-	-	-	3	3
	CO4	3	2	2	2	-	-	-	-	-	-	-	2	3	2
	CO5	2	3	3	3	-	-	-	-	-	-	-	2	3	3

	CO6	2	2	-	2	-		-	-	-	-	-	1	3	2
	Avg	**2.33**	**2.17**	**1.6**	**2.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.8**	**3**	**2.17**
EC703	CO1	-	-	-	-	3	-	-	-	-	-	-	2	2	1
	CO2	2	2	-	2	3	-	-	-	-	-	-	2	2	3
	CO3	1	2	-	2	3	-	-	-	-	-	-	2	1	2
	CO4	-	-	-	-	3	-	-	-	-	-	-	2	1	2
	CO5	-	-	-	2	3	-	-	-	-	-	-	2	1	3
	Avg	**1.5**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.4**	**2.2**
EC704	CO1	-	1	-	1	-	-	-	-	-	-	-	2	3	1
	CO2	1	2	-	3	-	-	-	-	-	-	-	2	2	2
	CO3	1	2	-	3	-	-	-	-	-	-	-	3	2	2
	CO4	-	2	-	2	-	-	-	-	-	-	-	3	2	2
	CO5	1	1	-	2	-	-	-	-	-	-	-	1	3	1
	Avg	**1**	**1.6**	**-**	**2.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.2**	**2.4**	**1.6**

8th Semester

Course Outcomes		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**
EC801	CO1	2	2	1	-	-	-	-	-	-	-	-	1	1	1
	CO2	2	3	2	-	1	-	-	-	-	-	-	2	2	2
	CO3	2	2	2	-	1	-	-	-	-	-	-	2	2	2
	CO4	1	2	2	-	-	-	-	-	-	-	-	1	2	1
	CO5	2	2	2	-	1	-	-	-	-	-	-	2	2	2
	CO6	1	1	2	-	-	-	-	-	-	-	-	2	2	2
	Avg	**1.67**	**2**	**1.83**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1.67**	**1.83**	**1.67**
EC802	CO1	3	2	1	-	-	-	-	-	-	-	-	1	2	1
	CO2	1	1	2	-	-	-	-	-	-	-	-	3	3	2
	CO3	2	2	1	-	-	-	-	-	-	-	-	2	2	2
	CO4	3	3	2	-	-	-	-	-	-	-	-	3	3	3
	CO5	2	2	1	-	-	-	-	-	-	-	-	2	2	2
	CO6	2	2	2	-	-	-	-	-	-	-	-	2	1	1
	Avg	**2.17**	**2**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.17**	**2.17**	**1.83**
EC8EA	CO1	1	2	1	-	-	-	-	-	-	-	-	2	3	1
	CO2	3	2	1	-	-	-	-	-	-	-	-	2	3	2
	CO3	1	2	1	-	-	-	-	-	-	-	-	2	3	3
	CO4	1	2	3	-	-	-	-	-	-	-	-	2	3	2
	CO5	1	2	1	-	-	-	-	-	-	-	-	2	3	3
	CO6	1	2	2	-	-	-	-	-	-	-	-	2	3	2
	Avg	**1.33**	**2**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**2.17**
EC8EG	CO1	2	2	-	-	-	-	-	-	-	-	-	1	3	1
	CO2	1	2	-	-	-	-	-	-	-	-	-	1	3	2
	CO3	1	2	-	-	2	-	-	-	-	-	-	2	2	3
	CO4	-	3	2	-	-	-	-	-	-	-	-	2	2	2
	CO5	1	3	2	-	-	-	-	-	-	-	-	2	2	2
	CO6	-	3	2	-	-	-	-	-	-	-	-	2	2	2
	Avg	**1.25**	**2.5**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1.67**	**2.33**	**2**
GW8PA	CO1	3	3	-	-	-	-	-	-	-	-	-	-	3	1
	CO2	2	2	2	1	3	-	-	-	-	-	-	-	1	2
	CO3	-	-	-	-	3	-	-	-	-	-	1	2	-	2
	CO4	-	-	3	-	3	-	-	-	-	-	-	2	-	3
	CO5	-	-	-	-	-	-	-	2	3	3	3	2	-	-
	Avg	**2.5**	**2.5**	**2.5**	**1**	**3**	**-**	**-**	**2**	**3**	**3**	**2**	**2**	**2**	**2**

Enter correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
It there is no correlation, put "-"

Representative Courses

PO1: Apply Knowledge of mathematics, science and engineering fundamentals in the field of Electronics & Communication and its allied areas.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Mathematics - I	3.00	Pulse & Digital Circuits	1.83
Mathematics – II	3.00	Engineering Physics Laboratory	1.80
Engineering Physics	3.00	Antennas and Wave Propagation	1.80
Mathematics – III	3.00	Computer Architecture & Organization	1.67
Engineering Mechanics	3.00	Cellular Mobile Communication	1.67
Network Analysis	3.00	Digital Communications Lab	1.60
Networks &Electrical Technology Lab	3.00	Engineering Chemistry	1.50
Control Systems	3.00	Data Structures	1.50
Open Elective (Bio Medical Engineering)	3.00	Switching Theory & Logic Design	1.50
Seminar	3.00	Analog Communications	1.50
Digital Image Processing	3.00	V L S I Lab	1.50
Project & Seminar	2.50	Computer Programming	1.40
Digital Signal Processing Lab	2.40	EM Waves and Transmission Lines	1.33
Digital Signal Processing	2.33	Microwave Engineering	1.33
Optical Communication (Elective II)	2.33	Satellite Communication (Elective III)	1.33
Electronic Measurements and Instrumentation	2.17	Microprocessors and Microcontrollers	1.25
Engineering Drawing	2.00	Low Power IC Design (Elective IV)	1.25
Signals & Systems	2.00	Digital System Design & Digital IC Applications	1.17
Electrical Technology	2.00	Engineering Workshop& IT Workshop	1.00
Electronic Circuit Analysis	2.00	Engineering Chemistry Laboratory	1.00
Management Science	2.00	Computer Programming Lab	1.00
Linear IC Applications	2.00	Electronic Devices and Circuits Lab	1.00
Pulse & Digital Circuits Lab	2.00	Electronic Circuit Analysis Lab	1.00
Digital Communications	2.00	Analog Communications Lab	1.00
VLSI Design	2.00	LIC Applications Lab	1.00
Computer Networks	2.00	Microprocessors and Microcontrollers Lab	1.00
Radar Systems (Elective I)	2.00	Microwave Engineering Lab	1.00
Electronic Devices and Circuits	1.83	Applied / Engineering Physics – Virtual Labs - Assignments	1
Random Variables & Stochastic Processes	1.83		

PO2: Identify, formulate and analyze complex electronics and communication engineering problems using the principles of mathematics and engineering sciences to reach substantiated conclusions.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Signals & Systems	2.83	Electronic Measurements and Instrumentation	2.00
Digital Image Processing	2.67	Satellite Communication (Elective III)	2.00
Digital Signal Processing	2.60	EM Waves and Transmission Lines	1.83
Control Systems	2.50	VLSI Design	1.83
Low Power IC Design (Elective IV)	2.50	Pulse & Digital Circuits Lab	1.80
Project & Seminar	2.50	Engineering Physics	1.67

Pulse & Digital Circuits	2.33	Computer Programming	1.67
Antennas and Wave Propagation	2.33	Network Analysis	1.67
Digital Communications	2.33	Data Structures	1.67
Computer Networks	2.33	Electronic Circuit Analysis	1.67
Networks &Electrical Technology Lab	2.20	Switching Theory & Logic Design	1.67
Digital Signal Processing Lab	2.20	Digital System Design & Digital IC Applications	1.67
Random Variables & Stochastic Processes	2.17	Microwave Engineering	1.67
Linear IC Applications	2.17	Microwave Engineering Lab	1.60
Optical Communication (Elective II)	2.17	Microprocessors and Microcontrollers	1.50
Mathematics - I	2.00	Computer Architecture & Organization	1.50
Mathematics – II	2.00	Microprocessors and Microcontrollers Lab	1.40
Mathematics – III	2.00	Electrical Technology	1.17
Engineering Mechanics	2.00	Engineering Drawing	1.00
Electronic Devices and Circuits	2.00	Engineering Physics Laboratory	1.00
Management Science	2.00	Engineering Workshop& IT Workshop	1.00
Analog Communications	2.00	Engineering Chemistry	1.00
Open Elective (Bio Medical Engineering)	2.00	Engineering Chemistry Laboratory	1.00
Digital Communications Lab	2.00	Electronic Devices and Circuits Lab	1.00
Seminar	2.00	Electronic Circuit Analysis Lab	1.00
Radar Systems (Elective I)	2.00	Analog Communications Lab	1.00
V L S I Lab	2.00	LIC Applications Lab	1.00
Cellular Mobile Communication	2.00		

PO3: Design system components or processes for the solutions of complex electronics and communication engineering problem to meet the needs of public health, safety, societal and environmental issues.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Open Elective (Bio Medical Engineering)	3.00	Microwave Engineering	1.50
Microprocessors and Microcontrollers	2.50	Electronic Measurements and Instrumentation	1.50
Project & Seminar	2.50	Satellite Communication (Elective III)	1.50
Digital Communications Lab	2.40	Digital Signal Processing Lab	1.40
Pulse & Digital Circuits	2.33	Network Analysis	1.33
Digital Communications	2.33	Radar Systems (Elective I)	1.17
Computer Networks	2.33	Engineering Physics	1.00
Switching Theory & Logic Design	2.00	Professional Ethics and Human Values	1.00
Linear IC Applications	2.00	Engineering Physics Laboratory	1.00
Control Systems	2.00	Engineering Workshop& IT Workshop	1.00
Pulse & Digital Circuits Lab	2.00	Engineering Chemistry	1.00
Digital Signal Processing	2.00	Engineering Mechanics	1.00
VLSI Design	2.00	Computer Programming	1.00
Digital Image Processing	2.00	Engineering Chemistry Laboratory	1.00
Low Power IC Design (Elective IV)	2.00	Electronic Devices and Circuits	1.00
Signals & Systems	1.83	Data Structures	1.00
Cellular Mobile Communication	1.83	Environmental Studies	1.00
EM Waves and Transmission Lines	1.60	Electronic Circuit Analysis	1.00
Antennas and Wave Propagation	1.60	Random Variables & Stochastic Processes	1.00
Microprocessors and Microcontrollers Lab	1.60	IPR& Patents	1.00
Optical Communication (Elective II)	1.60		

Engineering Drawing	1.50		
Analog Communications	1.50		

PO4: Conduct experiments by using domain knowledge for analysis, interpretation and synthesis of the electronics and communication engineering problems to provide valid conclusions.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Electronic Devices and Circuits Lab	3.00	V L S I Lab	2.00
Electronic Circuit Analysis Lab	3.00	Computer Networks	1.67
Analog Communications Lab	3.00	Microwave Engineering	1.50
LIC Applications Lab	3.00	Electronic Devices and Circuits	1.40
Digital Communications Lab	3.00	Electronic Circuit Analysis	1.40
Digital Signal Processing Lab	2.60	Engineering Physics	1.33
Digital System Design & DICA Lab	2.40	Engineering Chemistry Laboratory	1.33
Optical Communication (Elective II)	2.40	Engineering Physics Laboratory	1.00
Microwave Engineering Lab	2.20	Engineering Workshop& IT Workshop	1.00
Networks &Electrical Technology Lab	2.00	Computer Programming Lab	1.00
Digital System Design & Digital IC Applications	2.00	Data Structures	1.00
Digital Communications	2.00	Microprocessors and Microcontrollers	1.00
Microprocessors and Microcontrollers Lab	2.00	Project & Seminar	1.00

PO5: Use appropriate techniques, resources and modern engineering & IT tools to model and simulate complex electronics and communication engineering problems.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Digital System Design & Digital IC Applications	3.00	LIC Applications Lab	2.00
Digital System Design & DICA Lab	3.00	Microprocessors and Microcontrollers	2.00
Digital Signal Processing Lab	3.00	Microwave Engineering	2.00
V L S I Lab	3.00	Low Power IC Design (Elective IV)	2.00
Project & Seminar	3.00	Computer Programming Lab	1.80
Microprocessors and Microcontrollers Lab	2.40	Signals & Systems	1.67
Mathematics - I	2.00	Engineering Chemistry Laboratory	1.00
Mathematics – II	2.00	Data Structures	1.00
Engineering Workshop& IT Workshop	2.00	Pulse & Digital Circuits Lab	1.00
Mathematics – III	2.00	Cellular Mobile Communication	1.00
Electronic Circuit Analysis Lab	2.00	Applied / Engineering Physics – Virtual Labs - Assignments	1
Analog Communications Lab	2.00		

PO6: Apply contextual knowledge to assess societal, health, safety, legal & cultural issues and its consequent responsibilities relevant to electronics and communication engineering practices.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
English – II	2.50	Pulse & Digital Circuits Lab	1.60
Digital Image Processing	2.20	Engineering Chemistry	1.33

Microprocessors and Microcontrollers	2.00	Professional Ethics and Human Values	1.17
Digital Signal Processing	2.00	English – I	1.00
Digital Communications	2.00	Engineering Chemistry Laboratory	1.00
Open Elective (Bio Medical Engineering)	2.00	Electronic Circuit Analysis	1.00
IPR& Patents	1.83	Management Science	1.00
Environmental Studies	1.67	Random Variables & Stochastic Processes	1.00
Microwave Engineering	1.67		

PO7: Apply professional engineering solutions in societal and environmental issues for the sustainable development.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Environmental Studies	2.50	Engineering Chemistry	1.33
Antennas and Wave Propagation	2.00	IPR& Patents	1.17
Management Science	1.67	Engineering Chemistry Laboratory	1.00
Professional Ethics and Human Values	1.50		

PO8: Apply the principles of professional ethics and responsibilities to social issues.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Professional Ethics and Human Values	3.00	Engineering Chemistry	1.00
Seminar	2.50	Managerial Economics and Financial Analysis	1.00
Project & Seminar	2.00	IPR& Patents	1.00
Environmental Studies	1.83		

PO9: Function effectively as an individual and as a leader in diverse and multidisciplinary teams.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Project & Seminar	3.00	English – I	1.50
Management Science	2.50	English – II	1.50
Professional Ethics and Human Values	2.00	Managerial Economics and Financial Analysis	1.33
Digital Communications Lab	2.00	English Communication Skills Lab -2	1.00
IPR& Patents	1.83	Seminar	1.00
Microprocessors and Microcontrollers Lab	1.80		

PO10: Communicate proficiently through presentations and connect a range of audience with an effective oral and written communication.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Seminar	3.00	Management Science	1.80
Project & Seminar	3.00	English – II	1.67
English - Communication Skills Lab-1	2.20	English – I	1.33
English Communication Skills Lab -2	2.20	Managerial Economics and Financial Analysis	1.25
Digital Communications Lab	2.00	Applied / Engineering Physics – Virtual Labs - Assignments	1

PO11: Apply the knowledge of engineering and management principles to manage projects in multidisciplinary environment.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Management Science	2.60	IPR& Patents	1.67
Mathematics - I	2.00	Seminar	1.50
Mathematics – II	2.00	Professional Ethics and Human Values	1.00
Mathematics – III	2.00	Microprocessors and Microcontrollers Lab	1.00
Project & Seminar	2.00	Digital Communications Lab	1.00
Managerial Economics and Financial Analysis	1.83		

PO12: Develop and recognize the need for an ability to engage in life- long learning for the changing technological environment.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Managerial Economics and Financial Analysis	3.00	Pulse & Digital Circuits Lab	1.80
Management Science	3.00	Optical Communication (Elective II)	1.80
EM Waves and Transmission Lines	2.50	Switching Theory & Logic Design	1.67
Computer Networks	2.50	Digital Communications	1.67
Signals & Systems	2.33	Cellular Mobile Communication	1.67
Microwave Engineering Lab	2.20	Low Power IC Design (Elective IV)	1.67
Digital Image Processing	2.17	Computer Programming	1.50
Electronic Measurements and Instrumentation	2.17	Electronic Devices and Circuits	1.50
Mathematics - I	2.00	Linear IC Applications	1.50
Mathematics – II	2.00	Digital System Design & Digital IC Applications	1.50
Mathematics – III	2.00	IPR& Patents	1.50
Network Analysis	2.00	Seminar	1.50
Random Variables & Stochastic Processes	2.00	Pulse & Digital Circuits	1.33
Antennas and Wave Propagation	2.00	Microwave Engineering	1.33
LIC Applications Lab	2.00	Radar Systems (Elective I)	1.33
Digital System Design & DICA Lab	2.00	Analog Communications	1.17
Microprocessors and Microcontrollers	2.00	VLSI Design	1.17
Microprocessors and Microcontrollers Lab	2.00	Professional Ethics and Human Values	1.00
Digital Signal Processing Lab	2.00	Electronic Devices and Circuits Lab	1.00
V L S I Lab	2.00	Electronic Circuit Analysis	1.00
Satellite Communication (Elective III)	2.00	Analog Communications Lab	1.00
Project & Seminar	2.00	Computer Architecture & Organization	1.00
Digital Signal Processing	1.83	Applied / Engineering Physics – Virtual Labs - Assignments	1

PSO1: To acquire knowledge required for designing electronics and communication systems.

Subject Name	Average Level of mapping	Subject Name	Average Level of mapping
Control Systems	3.00	Seminar	2.00
Radar Systems (Elective I)	3.00	Project & Seminar	2.00
Optical Communication (Elective II)	3.00	Analog Communications	1.83

Satellite Communication (Elective III)	3.00	Cellular Mobile Communication	1.83
Signals & Systems	2.83	Electronic Devices and Circuits	1.67
Digital Signal Processing Lab	2.80	Electronic Circuit Analysis	1.67
Digital Image Processing	2.67	Linear IC Applications	1.67
Digital Signal Processing	2.50	Digital System Design & Digital IC Applications	1.67
Open Elective (Bio Medical Engineering)	2.50	Microprocessors and Microcontrollers	1.67
Pulse & Digital Circuits Lab	2.40	LIC Applications Lab	1.60
Microwave Engineering Lab	2.40	Digital System Design & DICA Lab	1.60
Low Power IC Design (Elective IV)	2.33	Switching Theory & Logic Design	1.50
Random Variables & Stochastic Processes	2.17	V L S I Lab	1.40
Pulse & Digital Circuits	2.17	Computer Architecture & Organization	1.25
VLSI Design	2.17	Network Analysis	1.00
Electronic Measurements and Instrumentation	2.17	Electrical Technology	1.00
Data Structures	2.00	Electronic Devices and Circuits Lab	1.00
EM Waves and Transmission Lines	2.00	Networks &Electrical Technology Lab	1.00
Antennas and Wave Propagation	2.00	Electronic Circuit Analysis Lab	1.00
Digital Communications	2.00	Analog Communications Lab	1.00
Microprocessors and Microcontrollers Lab	2.00	Microwave Engineering	1.00
Digital Communications Lab	2.00		

PSO2: To design, simulate and implement essential modules in the areas of Electronic circuits, VLSI, Embedded systems, Communication and Signal processing.

Subject Name		Subject Name	
Electronic Circuit Analysis Lab	3.00	Microwave Engineering	2.00
LIC Applications Lab	3.00	VLSI Design	2.00
Open Elective (Bio Medical Engineering)	3.00	Low Power IC Design (Elective IV)	2.00
Digital System Design & Digital IC Applications	2.67	Project & Seminar	2.00
Digital Communications	2.67	Linear IC Applications	1.83
Pulse & Digital Circuits Lab	2.60	Electronic Measurements and Instrumentation	1.83
Digital Communications Lab	2.60	Network Analysis	1.67
Digital Signal Processing Lab	2.60	Electronic Circuit Analysis	1.67
Electronic Devices and Circuits Lab	2.40	Computer Networks	1.67
Analog Communications Lab	2.40	Cellular Mobile Communication	1.67
Digital Signal Processing	2.40	Microwave Engineering Lab	1.60
Antennas and Wave Propagation	2.33	Computer Programming	1.50
Digital Image Processing	2.33	Random Variables & Stochastic Processes	1.50
V L S I Lab	2.20	EM Waves and Transmission Lines	1.50
Radar Systems (Elective I)	2.17	Analog Communications	1.50
Optical Communication (Elective II)	2.17	Pulse & Digital Circuits	1.50
Satellite Communication (Elective III)	2.17	Microprocessors and Microcontrollers	1.50
Data Structures	2.00	Computer Programming Lab	1.40
Signals & Systems	2.00	Microprocessors and Microcontrollers Lab	1.40
Electrical Technology	2.00	Mathematics - I	1.00
Switching Theory & Logic Design	2.00	Mathematics – II	1.00
Control Systems	2.00	Mathematics – III	1.00
Digital System Design & DICA Lab	2.00	Electronic Devices and Circuits	1.00

Enter correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment of Course Outcomes

Assessment Process

The assessment process used for the evaluation of Course Outcome is listed below:

Direct Assessment process

- Internal Tests
- Assignment
- Online Quiz
- Internal Laboratory Tests
- Semester-End examination (Theory/ Practical)
- Project work
- Seminar

Indirect Assessment process

- Course end survey

Direct Assessment Process:

The assessment process of course outcomes mainly depends on the performance of students in the examination as scheduled by JNTUK from time to time. As per the University regulations

a.) There are 2 MID-term Internal tests (each MID-term Internal test consists of 30 marks and it comprises of descriptive tests (15M), Online quiz (10) and assignment (5M). The best of the two is considered under R13 regulation. The university conducts External Semester End Examination that carries a weightage of 70 marks.

The following rubric is used to evaluate assignment marks

DIMENSIONS	SCALES			
	4	3	2	1
Understanding the Topic (1M)	Complete Understanding of the topic.	Part of the topic is misunderstood.	Most of the topic is misunderstood.	Complete misunderstanding of the topic.
Organization / Logic / Relevance (3M)	The solution is well written statements are mutually supporting and followed from one another to address the question. Achieves the Learning Objective.	Some parts are not clear, statements are usually mutually supporting and follow from one another but does not address the question explicitly to achieve the Learning Objective.	Most of the parts are not clear, statements hang together but other parts are unclear to address the question. Achieves Learning Objectives minimally.	It is hard or impossible to understand since answers of the question are either too vague or filled with trivial details. Fails to achieve the Learning Objectives.
On Time Submission (1M)	Submission of Assignment on time.	Submission of Assignment almost on time.	Submission of Assignment with little delay.	Submission of Assignment is late.

b.) Practical Examination

For the subjects having practical examinations, the maximum marks are 70 and is distributed as follows:

Internal Evaluation

i. Day to Day Evaluation (10M)
ii. Record work (5M)
iii. Internal Lab examination (10M)

External Evaluation

iv. External Lab Examination carries a weightage of 50M

The following rubric is used to evaluate Lab internal Evaluation marks

Internals	Dimensions	Scales			
		4	3	2	1
Day to Day Performance	**Attendance (1)**	Attended and completed on the same day	Attended and partially completed on the same day	Attended but completed in the extra lab	Not attended but completed in the extra lab
	Understanding of the Experiment (2)	Complete understanding of the experiment with learning objectives	Partial understanding of the experiment with learning objectives	Most of the experiment misunderstood	Complete misunderstanding of the experiment
	Implementation with result analysis (5)	Complete implementation with result analysis and interpretation	Complete implementation with result analysis only	Complete implementation with result analysis and interpretation in extra lab	Complete implementation with result analysis only in extra lab
	Observation submission on time (2)	Submission of the observation on time	Submission of the observation almost on time	Submission of the observation immediately after the extra lab	Submission of the observation after the extra lab
Record	**Comprehensiveness & Legible (3)**	Write all the elements of the experiments which can be easily readable	Write all the elements of the experiments with poor handwriting	Some elements are missing but presented clearly	Some elements are missing and poor handwriting
	Timely Submission (2)	Submission of the record on time	Submission of the record almost on time	Submission of the record immediately after the extra lab	Submission of the record after the extra lab
Internals	**Aim of the experiment (2)**	Complete understanding of the learning objectives and outcomes	Complete understanding of the learning objectives only	Partial understanding of the learning objectives	Misunderstanding of the learning objectives
	Write up (3)	Write all the elements of the experiments which can be easily	Write all the elements of the experiments with	Some elements are missing but presented clearly	Some elements are missing and poor handwriting

		readable	poor handwriting		
	Implementation & result analysis **(3)**	Complete implementation with result analysis and interpretation	Complete implementation with result analysis only	Partial implementation with result analysis only	Partial implementation only
	Viva- Voce **(2)**	Experiment and subject knowledge with good oral presentation	Experiment and subject knowledge with poor oral presentation	Partial experiment knowledge with poor oral presentation	Partial subject knowledge with poor oral presentation

c.) The Project work carries a total of 200 marks and of which 60 marks are internal and the rest 140 marks are awarded by the External.

- The project internal mark of 60 is distributed as follows

1) Day-to-Day Work (10 Marks)
2) Involvement in Project (10 Marks)
3) Team Work and Time Management (5Marks)
4) Regularity (5 Marks)
5) Review-1 (10 Marks)
6) Review-2 (20 Marks)

- The Final External Review carries 140 Marks and is conducted by External Faculty nominated by JNTUK together with Internal Project Review Committee.

The following rubric is used to evaluate Project marks

Project Internals	Dimensions	Scales			
		4	3	2	1
Day to Day Performance by Guide	**Day to Day work (10M)**	Successfully completed the work in time with result analysis and interpretation with required learning objectives	Successfully completed the work in time with validation of results and required learning objectives	Successfully completed the work in time but validations are used at some places only	Successfully completed the work with changes as suggested with delay
	Involvement (10M)	Able to handle all work related questions with illustrative explanation	Answered most questions correctly and with less illustrative explanation	Answered most questions correctly but sometimes needed clarifications	Answered few questions
	Team work & Time Management (5M)	Contribution towards completion of the assigned work in the team for timely submission	Contribution towards completion of the assigned work in the team with a delay	Independently completed the assigned work in the team but accepted with modifications	Independently completed the assigned work but team usually rejects
	Regularity (5M)	Students having more than 85% in the project attendance	Students having 80%-85% in the project attendance	Students having 75%-80% in the project attendance	Students having 65%- 75% in the project attendance
Project Review I & II	**Understanding of the problem and applicability (5M)**	Excellent understanding of the problem and interpretation with required project outcomes	Understanding of the problem and lack of interpretation with required project outcomes	Minimum Understanding of the problem with required project outcomes	Lack of understanding of the problem and project outcomes
	Presentation (5M)	Excellent preparation, Well delivered and organised	Good delivery and preparation, presents idea in an effective manner	Preparation, organisation and delivery satisfactory	Lack of delivery and organisation, minimum preparation
	Analysis, Design and Implementation with valid results (5M)	Able to analyze, Design and implement with valid results of the given problem statement	Able to analyze, Design and implement with results of the given problem statement	Able to analyze and Design the given problem statement	Able to analyze the given problem statement
	Viva (5M)	Able to answer with precision & completeness; confident and professional	Able to answer with precision & completeness ; almost confident and professional	Able to answer with precision but lack of confidence and professional behaviour	Missing conceptual information with lack of confidence and professional behaviour
	Regularity (5M)	Students having more than 85% in the project attendance	Students having 80%-85% in the project attendance	Students having 75%-80% in the project attendance	Students having 65%- 75% in the project attendance
	Project Progress (5M)	Completed 41%-50% of the project, In consultation with	Completed 31%-40% of the project, In consultation with guide and team	Completed 26%-30% of the project, In consultation with guide	Completed 21%-25% of the project, In consultation with guide and team

	(only for Project Review I)	guide and team members	members	and team members	members
	Documentation **(5M)** (only for Project Review II)	The work is organised with clear diagrams and sketches using efficient strategy and/or procedures	The work is organised with clear diagrams and sketches using almost effective strategy and/or procedures	Sometime uses effective strategy but with inconsistent diagrams and sketches	The work appears unorganised, rarely uses effective strategies with inconsistent diagrams and sketches

The following rubric is used to evaluate Best Project

Factors	**3**	**2**	**1**
Objective and Problem Definition **(10 M)**	Objective and problem definitions are well defined. Extensive explanation on the limitations of the existing system. Advanced or Innovative idea.	Objective and problem definitions are well defined. Extensive explanation on the limitations of the existing system.	Objective and problem definitions are well defined. Good/ moderate explanation on the existing system.
Implementation and Results **(30 M)**	Implemented and obtained valid results. Comparison of the results with results of existing system.	Implemented and obtained valid results. Extensive Analysis and description of the obtained results.	Implemented and obtained valid results. Good/Moderate Analysis and description of the obtained results.
Usage of Modern Tools **(25 M)**	Effective usage of modern Software/Hardware for implementation	Moderate usage of modern Software/Hardware for implementation	usage of conventional Software/Hardware for implementation
Technical Report Writing **(25 M)**	Thesis is well written and organized as per the given template with clear diagrams and equations using toolboxes	Thesis is well written and organized as per the given template with clear diagrams and equations	Thesis is well written and appears unorganized as per the given template with inconsistent diagrams and equations
Useful for society **(5 M)**	Prototype is developed and can be upgraded for real time usage in society and recognized by external agencies	Prototype is developed and can be upgraded for real time usage in society	Prototype is developed and need further improvement to meet real time usage in society
Scope for publication (5 M)	The results and discussions presented are better than the existing system with use of new methods.	The results and discussions presented can be extended to improve the results than the existing system.	Need more analysis on results and discussions to know the derived results are better than the existing systems.

d.) For the Seminar, the student collects the information on a specialized topic and prepare a technical report, showing his/her understanding over the topic, and submit to the Department, which will be evaluated by the Departmental committee consisting of Head of the Department, Seminar supervisor and Senior faculty members. The Seminar report is evaluated for 50 marks. There is no external examination for Seminar.

The following rubric is used to evaluate seminar marks

Dimensions	**Scales**			
	4	**3**	**2**	**1**
Presentation (10M)	Excellent preparation, Well delivered and organised	Good delivery and preparation, presents idea in an effective manner	Preparation, organisation and delivery satisfactory	Lack of delivery and organisation, minimum preparation
Understanding of the topic (10M)	Excellent understanding of the topic and interpretation with required learning outcomes	Understanding of the topic and lack of interpretation with required learning outcomes	Minimum Understanding of the topic with required learning outcomes	Lack of understanding of the topic and learning outcomes
Viva (10M)	Able to answer with precision & completeness; confident and professional	Able to answer with precision & completeness ; almost confident and professional	Able to answer with precision but lack of confidence and professional behaviour	Missing conceptual information with lack of confidence and professional behaviour
Time Management (5M)	Effective time management	Almost completed within the given time	Exceeded time limit	Lack of time management
Seminar Report (15M)	The work is organised with clear diagrams and sketches using efficient strategy and/or procedures	The work is organised with clear diagrams and sketches almost using effective strategy and/or procedures	Sometime uses effective strategy but with inconsistent diagrams and sketches	The work appears unorganised, rarely uses effective strategies with inconsistent diagrams and sketches

Indirect Assessment process:

Course end survey

- At the end of each semester, students feedback is obtained on each CO for each course.
- They are advised to follow the template carefully and mark their feedback whether all COs are met with designated cognitive level.

Assessment Tool

The list of assessment tool for the attainment of course outcomes with the detailed explanation is given below.

Assessment tools for the attainment of course outcomes

<table>
<tr><th>Sl. No.</th><th>Assessment Tool</th><th>Frequency</th><th>Stake holder</th><th>Responsible</th><th>Description</th></tr>
<tr><td colspan="6">Direct Methods</td></tr>
<tr><td>1</td><td>Internal Tests</td><td>Twice in a semester</td><td>Student</td><td>Subject Coordinator/ Faculty member</td><td>
<table>
<tr><td colspan="4">Internal test 1</td></tr>
<tr><td>Q. No.</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>CO#</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>Marks</td><td>10</td><td>10</td><td>10</td></tr>
<tr><td colspan="4">Internal test 2</td></tr>
<tr><td>Q. No.</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>CO#</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Marks</td><td>10</td><td>10</td><td>10</td></tr>
</table>

DAC will ensure the quality of question and scheme of evaluation
The marks secured by the students from the above internal tests are considered as one of the component for the evaluation of course outcomes

</td></tr>
<tr><td>2</td><td>Internal Laboratory Tests</td><td>Twice in a semester</td><td>Student</td><td>Faculty member</td><td>Experiment wise evaluation/ Weekly evaluation of Day-to-Day and Record work for each experiment is evaluated for the marks 10 and 5 respectively.
Two internal tests are conducted for 10 marks each covering all the list of experiments as per JNTUK syllabus.
The rubrics developed for evaluation of Day-to-Day, Record work and internal marks are used.</td></tr>
<tr><td>3</td><td>Assignment</td><td>Twice in a semester</td><td>Student</td><td>Subject Coordinator/</td><td>Assignment 1 questions covering CO1-CO3 is given to students</td></tr>
</table>

				Faculty member	***before the internal test1 to evaluate for 5 marks as per the rubric.*** ***Assignment 2 questions covering CO4-CO6 is given to students before the internal test2 to evaluate for 5 marks as per the rubric.***
4	*Online quiz*	*Twice in a semester*	*Student*	*JNTUK*	***Quiz 1 of 20 questions covering unit 1-3 is conducted for the students during the internal test1 by JNTUK to evaluate for 10 marks.*** ***Quiz 2 of 20 questions covering unit 4-6 is conducted for the students during the internal test1 by JNTUK to evaluate for 10 marks.***
5	*Semester-End Examinations (Theory / Practical)*	*Once in a semester*	*Student*	*JNTUK*	***The external theory exam is conducted by JNTUK for 70 marks covering all 6 units.*** ***The external lab exam is scheduled by JNTUK for 50 marks covering all experiments.***
Indirect Methods					
1	*Course end survey*	*End of each semester*	*Student*	*Course Coordinator / Faculty member*	***Collecting feedback from the students on every unit from 1-6 mapped to CO1-CO6 for verifying the quality of the course delivery.***

Direct Assessment of theory course:

CO Attainment process for Theory course for each student

Internal Test 1					
CO1	**CO2**	**CO3**	**Assignment-1**	**Quiz-1**	**Evaluation Formula**
A	**B**	**C**	**D**	**E**	**F**
10	10	10	5	10	Internal.CO1=(A+D+E)/25*100*0.3 Internal.CO2=(B+D+E)/25*100*0.3 Internal.CO3=(C+D+E)/25*100*0.3
Internal Test 2					
CO4	**CO5**	**CO6**	**Assignment-2**	**Quiz-2**	**Evaluation Formula**
A	**B**	**C**	**D**	**E**	**F**
10	10	10	5	10	Internal.CO4=(A+D+E)/25*100*0.3 Internal.CO5=(B+D+E)/25*100*0.3 Internal.CO6=(C+D+E)/25*100*0.3

Final CO attainment for a student	
CO1	CO1= Internal.CO1+(Semester-end exam/70*100*0.7)
CO2	CO2= Internal.CO2+(Semester-end exam/70*100*0.7)
CO3	CO3= Internal.CO3+(Semester-end exam/70*100*0.7)
CO4	CO4= Internal.CO4+(Semester-end exam/70*100*0.7)
CO5	CO5= Internal.CO5+(Semester-end exam/70*100*0.7)
CO6	CO6= Internal.CO6+(Semester-end exam/70*100*0.7)

Direct Assessment of a laboratory course

CO Attainment process for Laboratory course for each student

Evaluation Formula for CO1				
Observation	**Record**	**Internal Test**	**Semester-end Exam Mark**	**Final CO Attainment**
A (Average of set of experiments mapped to CO1)	**B (Average of set of experiments mapped to CO1)**	**C**	**D**	**CO1=(A+B++C+D)/75*100**
10	**5**	**10**	**50**	

Similar process is used for the remaining COs.

Direct Assessment of Project work

The process of attainment of COs and POs/PSOs for the project work is described below.
Step1: There are five COs defined for the main project and to calculate the attainment of defined COs the specially designed project ARCO sheet is used.
Step 2: The project evaluation process follows the JNTUK guideline for finalizing the marks of each student.
Step 3: The final marks of each student in the main project is decided on two categories such as internal and external evaluation is considered for the evaluation of CO attainment.
Step 4: The internal evaluation is a kind of continuous assessment and is going through several reviews like Internal Review-I of 30 marks, Internal Review-II of 30 marks, and Guide evaluation of 30 marks.
Step 5: The final Internal 60 marks is decided by considering $1/3^{rd}$ of Internal Review-I + $2/3^{rd}$ of Internal Review-II+ Guide marks. The external 140 marks are decided by the external examiner assigned by JNTUK.
Step 6: The mapping of COs to the performance indicators decided in the rubric is given in Table below.

Mapping of COs with performance indicators

Performance indicators	Assigned marks	Mapping of COs
Understanding of the problem and applicability (PI1)	(5M)	CO1,CO2,CO3
Presentation (PI2)	(5M)	CO5
Analysis, Design and Implementation with valid Results (PI3)	(5M)	CO2,CO3,CO4
VIVA(PI4)	(5M)	CO1,CO2,CO3,CO4,CO5
Regularity(PI5)	(5M)	CO5
Project Progress / Documentation (PI6)	(5M)	CO5

Note: The weighted values of performance indicators (PI1-PI6) are 4/3/2/1

Step 7: The internal and external marks secured by a student are used to evaluate the overall attainment of COs.
Marks for the attainment of COs based on Internal Review-I
IR-1.CO1= ((PI1*5/4) + (PI4*5/4))/10*30
IR-1.CO2= ((PI1*5/4) + (PI3*5/4) + (PI4*5/4))/15*30
IR-1.CO3= ((PI1*5/4) + (PI3*5/4) + (PI4*5/4))/15*30
IR-1.CO4= ((PI3*5/4) + (PI4*5/4))/10*30
IR-1.CO5= ((PI2*5/4)+(PI4*5/4)+(PI5*5/4)+(PI6*5/4))/20*30
Marks for the attainment of COs based on Internal Review-II
IR-2.CO1= ((PI1*5/4)+(PI4*5/4))/10*30
IR-2.CO2= ((PI1*5/4)+(PI3*5/4)+(PI4*5/4))/15*30
IR-2.CO3= ((PI1*5/4)+(PI3*5/4)+(PI4*5/4))/15*30
IR-2.CO4= ((PI3*5/4)+(PI4*5/4))/10*30
IR-2.CO5= ((PI2*5/4)+(PI4*5/4)+(PI5*5/4)+(PI6*5/4))/20*30
Overall marks for the attainment of COs

- $M.CO_i$= ($1/3^{rd}$ of IR-1.CO_i + $2/3^{rd}$ of IR-2.CO_i + Guide marks+ External marks)/2; where i=1 to 5

Step 8: The final attainment of all COs is evaluated after recording all CO attainments of all students.

Direct Assessment of Seminar
The process of attainment of COs and POs/PSOs for the seminar is described below.
Step1: There are five COs defined for the seminar and to calculate the attainment of defined COs the specially designed seminar ARCO sheet is used.
Step 2: The seminar evaluation process follows the JNTUK guideline for finalizing the marks of each student.
Step 3: The final marks of each student in the seminar is decided by internal evaluation only for the evaluation of CO attainment.
Step 4: The internal evaluation is going through a presentation based on a report on technical topic submitted by the student.
Step 5: As per JNTUK, the seminar marks will be evaluated for 50 marks.
Step 6: The mapping of COs to the performance indicators decided in the rubric is given in Table below.

Mapping of COs with performance indicators

Performance indicators	Assigned marks	Mapping of COs
Understanding of the Topic (PI1)	(10M)	CO1,CO4,CO5
Presentation (PI2)	(10M)	CO2,CO3,CO4
VIVA(PI3)	(10M)	CO1,CO2,CO3
Time Management(PI4)	(5M)	CO2,CO3
Seminar Report (PI5)	(15M)	CO4,CO5

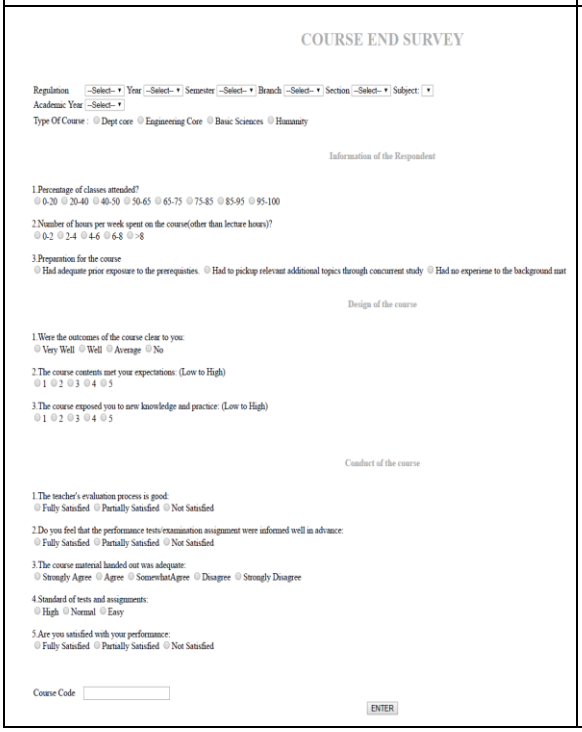
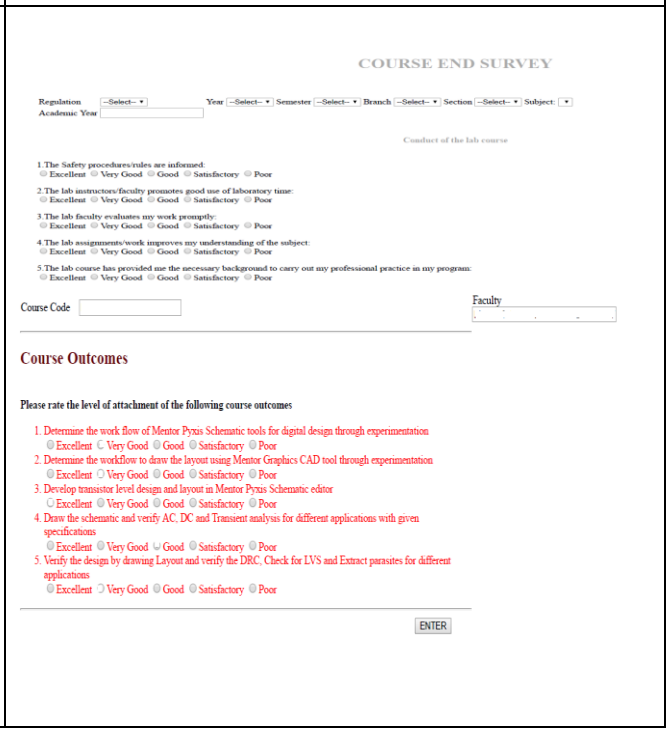
Note: The weighted values of performance indicators (PI1-PI5) are 4/3/2/1

Step 7: The internal marks secured by a student are used to evaluate the overall attainment of COs.

Marks for the attainment of COs based on Seminar Review
CO1= (((PI1*10/4)+(PI3*10/4)))/20*100
CO2= ((PI2*10)+(PI3*10)+(PI4*5))/4/25*100
CO3= ((PI2*10)+(PI3*10)+(PI4*5))/4/25*100
CO4= ((PI1*10)+(PI2*10)+(PI5*15))/4/35*100
CO5= ((PI1*10)+(PI5*15))/4/25*100

Step 8: The final attainment of all COs is evaluated after recording all CO attainments of all students. The evaluation process is given below
CO_i= (No. of students secured >= 50 % in CO_i)/ total No. of students * 100; where i=1 to 5

Indirect Assessment of a Theory/ Laboratory course
Template for course end survey

Course end survey of a Theory course	*Course end survey of a laboratory course*
	

Overall CO Attainment of a Theory/ laboratory course

A weigthage of 80 % is considered for direct assessment and 20% is considered for indirect assessment as per the guidelines given by DAC.

Attainment levels for all courses

The targets are set in terms of percentage of students getting more than the University average marks. The set target level is pass i.e 40% for every theory course where for a lab/ Seminar/ Project work, the set target level is 50%.

Measuring course outcomes attained through the combination of assessment tools for each student. The attainment levels for measuring COs for a course are defined as follows:

- If 60% or more of the students attain the set target, the attainment level is 1
- If 70% or more of the students attain the set target, the attainment level is 2
- If 80% or more of the students attain the set target, the attainment level is 3

Assessment of POs/PSOs

Assessment Process

The assessment process used for the evaluation of POs/PSOs is listed below:

Direct Assessment Methods

- Theory Subject CO attainment values
- Laboratory Subject CO attainment values
- Project work
- Seminar

Indirect Assessment Methods

- Student Exit Survey
- Employer Survey
- Alumni Survey
- Parent Survey

Assessment Tools and Processes

Sl. No.	Assessment Tool	Weightage %	Frequency	Stakeholder	Responsible	Description
Direct Assessment Methods						
1	Theory Subject CO attainment	80	End of each semester	Student	Course Coordinator/ Faculty member	CO attainment is calculated for every subject is considered as mentioned in 3.2
2	Laboratory Subject CO attainment		End of each semester	Student	Course Coordinator/ Faculty member	CO attainment is calculated for every laboratory is considered as mentioned in 3.2
3	Project work		IV-II	Student	PRC	CO attainment is calculated for the main project is considered as mentioned in 3.2
4	Seminar		III-II	Student	Faculty Coordinator/ Class Teacher	CO attainment is calculated for the seminar is considered as mentioned in 3.2
Indirect Assessment Methods						
1	Student Exit Survey	10	Annually for the out - going batch	Student	Program Coordinator	At the end of every academic year the present out-going batch is asked for a feedback about all the four years of stay in the campus related to academic and other

						administrative issues
2	Employer Survey	5	Every two years	Employer	Program Coordinator	Whenever any industry person/ Employers during visits to our college we request them to fill the survey form related to the progress of knowledge, skill and attitude of our students.
3	Alumni Survey	5	Every two years	Alumni (3 years after the graduation)	Program Coordinator	Whenever any Alumni visits to our campus or in Alumni meets we ask to our distinguished alumni to fill the survey form related to their progress of knowledge, skill and attitude
4	Parent Survey	5	Annually	Parent	Program Coordinator	We are collecting filled forms from parents, whenever any parent visits to our campus or when required we are asking to our students to collect from the parent

Note: For PO8 and PO10, the percentage contribution of indirect assessment for Employer, Alumni and Parent Survey are 3, 3 and 4 respectively.

Direct Assessment Method

For assessing the attainment of POs/PSOs, the overall CO attainment levels of each course is recorded from ARCO sheets and the average of the attainment level for the course is calculated.

Overall CO attainment level of a course

JNTUK Course Code	NBA Course Code	Course Name	Course Outcomes	Course Outcomes Attainment in %	Course Outcomes Attainment in %	Course Outcomes Attainment in %	Attainment level
				ECE-1	ECE-2	Overall	
			CO-1				
			CO-2				
			CO-3				
			CO-4				
			CO-5				
			CO-6				
					Average attainment level (X)=	$\sum_{1}^{6} CO_i /6$	

CO-POs/PSOs matrix defined for the course: Pulse and Digital Circuits

Course Outcome	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO1	2	3	3	-	-	-	-	-	-	-	-	2	3	2
CO2	2	2	3	-	-	-	-	-	-	-	-	1	2	1
CO3	2	3	3	-	-	-	-	-	-	-	-	1	2	1
CO4	2	3	3	-	-	-	-	-	-	-	-	1	3	2
CO5	2	2	1	-	-	-	-	-	-	-	-	1	1	1

CO6	1	1	1	-	-	-	-	-	-	-	-	2	2	2
CO-PO/PSO avg (Y)	1.83	2.33	2.33	-	-	-	-	-	-	-	-	1.33	2.17	1.50

The contribution of CO attainment values towards all POs and PSOs attainment are derived below

PO# = (X* Y)/3

where X is the average attainment level of a course and Y is the CO-POs/PSOs average value corresponding to the considered course for the particular POs/PSOs.

Indirect Assessment Methods

Feedback templates used for the attainment of POs and PSOs are shown below.

Sample Student Exit Survey

Exit Survey:

Name:

Email:

Branch:

Start

EXIT SURVEY

1. Indicate how well do you agree with Mission and Vision of the Department you Graduated from.

Strongly Agree Agree Partially Agree Disagree

2. Please Rate your opinion on the following aspects of Teaching - Learning process during four years of B.Tech program.

a. Program Outcomes (POs)

Qno	Question	Strongly Satisfied	Satisfied	Partially Satisfied	Dissatisfied
Q1	Apply Knowledge of mathematics, science and engineering fundamentals in the field of Electronics & Communication and its allied areas.				
Q2	Identify, formulate and analyze complex electronics and communication engineering problems using the principles of mathematics and engineering sciences to reach substantiated conclusions.				
Q3	Design system components or processes for the solutions of complex electronics and communication engineering problem to meet the needs of public health, safety, societal and environmental issues.				
Q4	Conduct experiments by using domain knowledge for analysis, interpretation and synthesis of the electronics and communication engineering problems to provide valid conclusions.				
Q5	Use appropriate techniques, resources and modern engineering & IT tools to model and simulate complex electronics and communication engineering problems.				
Q6	Apply contextual knowledge to assess societal, health, safety, legal & cultural issues and its consequent responsibilities relevant to electronics and communication engineering practices.				
Q7	Apply professional engineering solutions in societal and environmental issues for the sustainable development.				
Q8	Apply the principles of professional ethics and responsibilities to social issues.				
Q9	Function effectively as an individual and as a leader in diverse and multidisciplinary teams.				
Q10	Communicate proficiently through presentations and connect a range of audience with an effective oral and written communication.				
Q11	Apply the knowledge of engineering and management principles to manage projects in multidisciplinary environment.				
Q12	Develop and recognize the need for an ability to engage in life- long learning for the changing technological environment.				

Sample Parent form

GayatriVidyaParishad College of Engineering for Women
Madhurawada, Visakhapatnam
(Affiliated to JNTUK, Approved by AICTE, New Delhi)

FEEDBACK FROM PARENTS

We request you to assist us by answering a few questions/ suggestions listed below in connection with our services to your daughter / ward studying in our Institute. Your feedback would be invaluable to us in improving our teaching processes to serve the needs of our students better.

Name of the student:
Class:
JNTU Roll No.

Please tick the appropriate ratings:
4.Strongly Satisfied 3. Satisfied 2. PartiallySatisfied 1. Dissatisfied

		4	3	2	1
1	Learning experience provided to the students by college				
2	Knowledge gained by the student based on the academic ambience in the college				
3	Internal evaluation process in the college is fair and accurate.				
4	Improvement of your ward in written and oral communication skills				
5	Encouragement to students for participating in various co-curricular and extra-curricular activities				
6	Efforts taken for improving employability skills through training and placement activities.				
7	Books prescribed as per curriculum, relevant reference materials sufficiently available in the Library				
8	Infrastructural facilities like classrooms, laboratories, seminar halls, canteen and other facilities				
9	Transformation of the student into a good and responsible citizen with regard to societal and environmental issues.				
10	How strongly would you consider this Institute for admitting another student, if you have to				

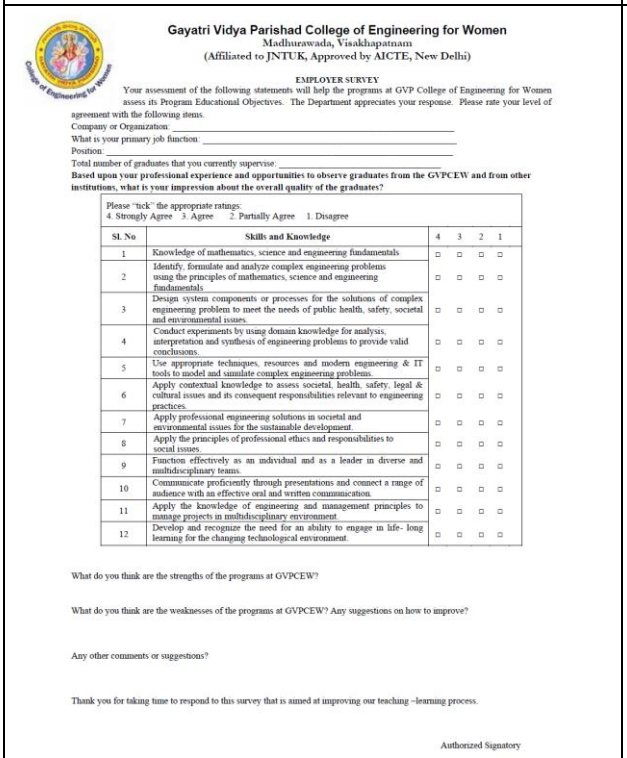
For office use only:
Overall average:

Any other information for the improvement of the institute:

Name:
Date:

Signature of Parent / Guardian

Sample Employer form



Gayatri Vidya Parishad College of Engineering for Women
Madhurawada, Visakhapatnam
(Affiliated to JNTUK, Approved by AICTE, New Delhi)

EMPLOYER SURVEY

Your assessment of the following statements will help the programs at GVP College of Engineering for Women assess its Program Educational Objectives. The Department appreciates your response. Please rate your level of agreement with the following items.

Company or Organization: _____
What is your primary job function: _____
Position: _____
Total number of graduates that you currently supervise: _____

Based upon your professional experience and opportunities to observe graduates from the GVPCEW and from other institutions, what is your impression about the overall quality of the graduates?

Please "tick" the appropriate ratings:
4. Strongly Agree 3. Agree 2. Partially Agree 1. Disagree

Sl. No	Skills and Knowledge	4	3	2	1
1	Knowledge of mathematics, science and engineering fundamentals	□	□	□	□
2	Identify, formulate and analyze complex engineering problems using the principles of mathematics, science and engineering fundamentals.	□	□	□	□
3	Design system components or processes for the solutions of complex engineering problem to meet the needs of public health, safety, societal and environmental issues.	□	□	□	□
4	Conduct experiments by using domain knowledge for analysis, interpretation and synthesis of engineering problems to provide valid conclusions.	□	□	□	□
5	Use appropriate techniques, resources and modern engineering & IT tools to model and simulate complex engineering problems.	□	□	□	□
6	Apply contextual knowledge to assess societal, health, safety, legal & cultural issues and its consequent responsibilities relevant to engineering practices.	□	□	□	□
7	Apply professional engineering solutions in societal and environmental issues for the sustainable development.	□	□	□	□
8	Apply the principles of professional ethics and responsibilities to social issues.	□	□	□	□
9	Function effectively as an individual and as a leader in diverse and multidisciplinary teams.	□	□	□	□
10	Communicate proficiently through presentations and connect a range of audience with an effective oral and written communication.	□	□	□	□
11	Apply the knowledge of engineering and management principles to manage projects in multidisciplinary environment.	□	□	□	□
12	Develop and recognize the need for an ability to engage in life- long learning for the changing technological environment.	□	□	□	□

What do you think are the strengths of the programs at GVPCEW?

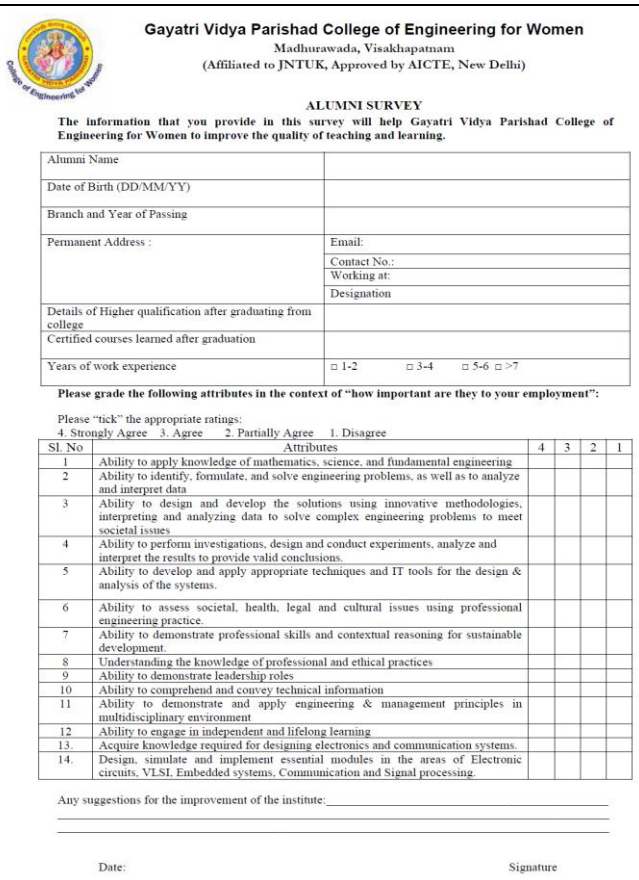
What do you think are the weaknesses of the programs at GVPCEW? Any suggestions on how to improve?

Any other comments or suggestions?

Thank you for taking time to respond to this survey that is aimed at improving our teaching –learning process.

Authorized Signatory

Sample Alumni form



Gayatri Vidya Parishad College of Engineering for Women
Madhurawada, Visakhapatnam
(Affiliated to JNTUK, Approved by AICTE, New Delhi)

ALUMNI SURVEY

The information that you provide in this survey will help Gayatri Vidya Parishad College of Engineering for Women to improve the quality of teaching and learning.

Alumni Name	
Date of Birth (DD/MM/YY)	
Branch and Year of Passing	
Permanent Address :	Email: Contact No.: Working at: Designation
Details of Higher qualification after graduating from college	
Certified courses learned after graduation	
Years of work experience	□ 1-2 □ 3-4 □ 5-6 □ >7

Please grade the following attributes in the context of "how important are they to your employment":

Please "tick" the appropriate ratings:
4. Strongly Agree 3. Agree 2. Partially Agree 1. Disagree

Sl. No	Attributes	4	3	2	1
1	Ability to apply knowledge of mathematics, science, and fundamental engineering				
2	Ability to identify, formulate, and solve engineering problems, as well as to analyze and interpret data				
3	Ability to design and develop the solutions using innovative methodologies, interpreting and analyzing data to solve complex engineering problems to meet societal issues.				
4	Ability to perform investigations, design and conduct experiments, analyze and interpret the results to provide valid conclusions.				
5	Ability to develop and apply appropriate techniques and IT tools for the design & analysis of the systems.				
6	Ability to assess societal, health, legal and cultural issues using professional engineering practice.				
7	Ability to demonstrate professional skills and contextual reasoning for sustainable development.				
8	Understanding the knowledge of professional and ethical practices				
9	Ability to demonstrate leadership roles				
10	Ability to comprehend and convey technical information				
11	Ability to demonstrate and apply engineering & management principles in multidisciplinary environment				
12	Ability to engage in independent and lifelong learning				
13.	Acquire knowledge required for designing electronics and communication systems.				
14.	Design, simulate and implement essential modules in the areas of Electronic circuits, VLSI, Embedded systems, Communication and Signal processing.				

Any suggestions for the improvement of the institute:_____

Date: Signature

Results of evaluation of POs and PSOs

A weigthage of 80 % is considered from direct assessment and 20% is considered from indirect assessment to evaluate the final attainment of POs/PSOs.

% of Contribution of Indirect assessment towards attainment of POs and PSOs

Indirect Attainment in *% of contribution*	Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO01	PSO 02
student exit survey	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Employer Survey	5	5	5	5	5	5	5	3	5	3	5	5	5	5
Alumni Survey	5	5	5	5	5	5	5	3	5	3	5	5	5	5
Parent Survey								4		4				
% of contribution	20	20	20	20	20	20	20	20	20	20	20	20	20	20

The attainment process of COs of all courses and POs/PSOs will be evaluated by following the assessment process described above. The attainment values for the mentioned parameters will be evaluated and recorded in Part II of NBA Handbook for R13 regulation.

Department of Electronics & Communication Engineering

Gayatri Vidya Parishad College of Engineering for Women

Kommadi, Madhurawada
Visakhapatnam-530048, AP, India

Affiliated to JNTUK, Kakinada

Visit us at www.gvpcew.ac.in

Planning, Assessment and Attainment:

Tools and Techniques for Program Continuous Improvement

Regulation: R13

PART-II

Institute Vision

To emerge as an acclaimed centre of learning that provides value based technical education for the holistic development of students.

Institute Mission

- Undertake activities that provide value based knowledge in Science, Engineering and Technology
- Provide opportunities for learning through Industry – Institute interaction on the state of the art technologies
- Create collaborative environment for the flourishment of research, innovation and entrepreneurship
- Promote activities that bring in a sense of social responsibility

Department Vision

Produce competitive engineers instilled with ethical and social responsibilities to deal with the technological challenges in the field of Electronics & Communication Engineering.

Department Mission

- Facilitate a value based educational environment that provides updated technical knowledge
- Provide opportunities for developing creative, innovative and leadership skills
- Imbue technological and managerial capabilities for a successful career and lifelong learning

Program Educational Objectives (PEOs)

- Analyze and apply the knowledge of Mathematics, Science and Engineering fundamentals for solving Electronics and Communication Engineering problems.
- Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.
- Excel in chosen career by exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.

Attainment of Course Outcomes

Record the attainment of Course Outcomes of all courses

- Attainment Report for Course Outcomes (ARCO) is designed using excel spreadsheet to mark CO attainments.
- For every course (Theory/ Practical) the respective ARCO sheet is available in the corresponding course files.
- One sample ARCO sheet is demonstrated for the course (Theory/ Practical) Pulse and Digital Circuits.
- Similarly, the specially designed ARCO sheet for Project and Seminar also demonstrated below.
- Finally, the attainment of course outcomes of all courses recorded for the admitted batches under R13 regulation.

Sample ARCO Copy of a Theory Course: Pulse and Digital Circuits

			Direct Assessment based on Marks										
			CO-1	CO-2	CO-3	A-1	CO-4	CO-5	CO-6	A-2	Q-1	Q-2	Sem End
Sl No	Name	Roll no	10	10	10	5	10	10	10	5	10	10	70
1	MANGIPUDI SAI SINDHUJA	14JG1A0461	5	7	5	5	-1	-1	-1	3	9	0	44
2	MANTHENA SPANDANA	14JG1A0462	6	6	6	5	5	10	6	5	10	8	28
3	MANTHRI PRATYUSHA	14JG1A0463	6	4	10	5	8	9	5	5	10	7	40
4	MARRAPU GOWTAMI RAO	14JG1A0464	4	4	10	5	2	4	2	5	10	0	24
5	MEERAPUREDDY ALEKHYA	14JG1A0466	6	9	10	5	8	9	8	5	10	7	54
6	MOKKA PRIYANKA	14JG1A0467	9	3	8	5	-1	-1	-1	5	10	0	54
7	MONICA SEKHAR MARE	14JG1A0468	0	1	3	5	1	6	2	5	7	8	32
8	MUDDANA MRUDULA	14JG1A0469	7	5	8	5	10	10	9	5	8	9	38
9	MURAPAKA PALLAVI	14JG1A0470	8	10	10	5	-1	-1	-1	5	9	0	39
10	MYLAPALLI PRATHYUSHA	14JG1A0471	7	7	10	5	2	6	7	5	3	6	40
11	NALIGIRI V S PRIYANKA	14JG1A0472	8	6	7	5	10	9	6	5	9	9	49
12	NAMMI LOHITHA	14JG1A0473	1	2	8	5	6	4	5	5	10	9	24

Recording Marks of all students for the course Pulse and Digital Circuits

Department of Electronics and Communication Engineering			
ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)			
Course Name:	Pulse and Digital Circuits		
Course Code:	RT31041	Academic Year:	2016-17
Year & Semester:	III-I	Section:	2
Name of the Course Instructor:	Mr. D V A N Ravi Kumar		

Student Name	Roll No	Course Outcomes	Mid Marks (10)	Assignment (5)	Quiz Marks (10)	End Exam (70)	CO Attainment (%)	Attainment Level
MANTHRI PRATYUSHA	14JG1A0463	CO1	6	5	10	40.00	65.20	Medium
		CO2	4	5	10	40.00	62.80	Medium
		CO3	10	5	10	40.00	70.00	High
		CO4	8	5	7	40.00	64.00	Medium
		CO5	9	5	7	40.00	65.20	Medium
		CO6	5	5	7	40.00	60.40	Medium

CO attainment of a student for the theory course Pulse and Digital Circuits

Gayatri Vidya Parishad College of Engineering for Women

Department of Electronics and Communication Engineering

ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)

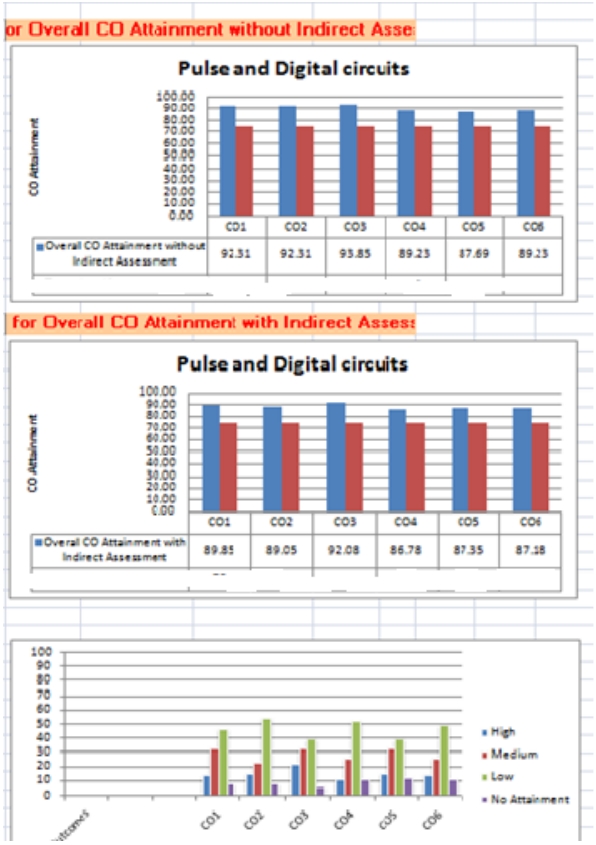
Course Name:	Pulse and Digital circuits		
Course Code:	RT31041	Academic Year:	2016-2017
Year & Semester:	III Year I Semester	Section:	2
ame of the Course Instructo	D.V.A.N.Ravikumar	BA Course Code:	EC501

Target Level	3		arget level in %		75		
Sl No	Roll No	CO1	CO2	CO3	CO4	CO5	CO6	OBE result
1	14JG1A0461	66.80	69.20	66.80	47.60	47.60	47.60	Cleared
2	14JG1A0462	53.20	53.20	53.20	49.60	55.60	50.80	Cleared
3	14JG1A0463	65.20	62.80	70.00	64.00	65.20	60.40	Cleared
4	14JG1A0464	46.80	46.80	54.00	32.40	34.80	32.40	Not Cleared
5	14JG1A0466	79.20	82.80	84.00	78.00	79.20	78.00	Cleared

Final CO Calculation

Course Outcomes	Overall CO Attainment without Indirect	Overall CO Attainment with Indirect Assessment	Course Outcomes	High	Medium	Low	No Attainment
CO1	92.31	89.85	CO1	13.85	32.31	46.15	7.69
CO2	92.31	89.05	CO2	15.38	23.08	53.85	7.69
CO3	93.85	92.08	CO3	21.54	32.31	40.00	6.15
CO4	89.23	86.78	CO4	10.77	26.15	52.31	10.77
CO5	87.69	87.35	CO5	15.38	32.31	40.00	12.31
CO6	89.23	87.18	CO6	13.85	26.15	49.23	10.77

Overall CO attainment of the theory course Pulse and Digital Circuits



Graphical representation of CO attainment of the theory course Pulse and Digital Circuits

Sample ARCO of the Laboratory Course: Pulse and Digital Circuits

			CO-1		CO-2		CO-3		CO-4		CO-5		Internal Test-1	Internal Test-2	Sem End
			Observation	Record	Observation	Record	Observation	Record	Observation	Record	Observation	Record			
Sl No	Name	Roll no	10	5	10	5	10	5	10	5	10	5	10	10	50
1	MANGIPUDI SAI SINDHUJA	14JG1A0461	5	5	8	5	8	5	9	4	7	5	9	10	47
2	MANTHENA SPANDANA	14JG1A0462	8	5	8	5	8	4	8	4	9	5	10	9	44
3	MANTHRI PRATYUSHA	14JG1A0463	6	5	8	5	8	5	8	5	8	5	10	10	44
4	MARRAPU GOWTAMI RAO	14JG1A0464	6	5	7	5	8	5	7	5	7	5	10	10	45
5	MEERAPUREDDY ALEKHYA	14JG1A0466	6	5	8	5	9	4	8	4	8	5	9	9	46
6	MOKKA PRIYANKA	14JG1A0467	8	5	9	5	8	5	7	5	9	5	8	9	49
7	MONICA SEKHAR MARE	14JG1A0468	6	5	8	5	8	5	8	5	9	5	10	10	43
8	MUDDANA MRUDULA	14JG1A0469	9	5	10	5	9	5	9	5	9	5	10	10	49
9	MURAPAKA PALLAVI	14JG1A0470	5	5	10	5	9	5	9	5	9	5	10	10	47
10	MYLAPALLI PRATHYUSHA	14JG1A0471	5	5	9	4	9	5	8	5	8	5	10	9	42
11	NALIGIRI V S PRIYANKA	14JG1A0472	9	5	10	5	9	5	10	5	9	5	10	10	47
12	NAMMI LOHITHA	14JG1A0473	5	5	8	5	9	5	8	5	8	5	9	9	46
13	NANDURI LAKSHMI SOWJANYA	14JG1A0474	7	5	9	5	10	5	10	5	9	5	10	10	49
14	NEELAMRAJU RAMAKAMALA	14JG1A0475	7	5	8	5	6	5	6	5	5	5	10	1	45

Recording Marks of students for a given laboratory course Pulse and Digital Circuits

Gayatri Vidya Parishad College of Engineering for Women

Department of Electronics and Communication Engineering

ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)

Course Name: PULSE AND DIGITAL CIRCUITS Lab

Course Code: RT31047 **Academic Year:** 2016-2017

NBA Course Code: EC505 **Section:** ECE-2

Year & Semester: III YEAR I SEM

Name of the Course Instructor: D.V.A.N.RAVI KUMAR/S.R REDDY/B.LAKSHMI

	Student Name	Roll No	Course Outcomes	Observation	Record	Internal Test	Sem End Test	CO Attainment (%)	Attainment Level
				10	5	10	50		
1	MANGIPUDI SAI SINDHUJA	14JG1A0461	CO1	5	5	9.00	47.00	88.00	High
			CO2	8	5	9.00	47.00	92.00	High
			CO3	8	5	10.00	47.00	93.33	High
			CO4	9	4	10.00	47.00	93.33	High
			CO5	7	5	10.00	47.00	92.00	High
	Student Name	Roll No	Course Outcomes	Observation	Record	Internal Test	Sem End Test	CO Attainment (%)	Attainment Level
				10	5	10	50		
2	MANTHENA SPANDANA	14JG1A0462	CO1	8	5	10.00	44.00	89.33	High
			CO2	8	5	10.00	44.00	89.33	High
			CO3	8	4	10.00	44.00	88.00	High
			CO4	8	4	9.00	44.00	86.67	High
			CO5	9	5	10.00	44.00	90.67	High
	Student Name	Roll No	Course Outcomes	Observation	Record	Internal Test	Sem End Test	CO Attainment	Attainment Level

Marks | Student wise CO | Overall CO

CO attainment of a student for the laboratory course Pulse and Digital Circuits

Gayatri Vidya Parishad College of Engineering for Women

Department of Electronics and Communication Engineering

ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)

Course Name: PULSE AND DIGITAL CIRCUITS Lab

Course Code: RT31047 **Academic Year:** 2016-2017

NBA Course Code: EC505 **Section:** ECE-2

Year & Semester: III YEAR I SEM

Name of the Course Instructor: D.V.A.N RAVI KUMAR/S.R REDDY/B.LAKSHMI

Target Level 3 **Target level in %** 85

Sl No	Roll No	CO1	CO2	CO3	CO4	CO5	OBE based result
1	14JG1A0461	88.00	92.00	93.33	93.33	92.00	Cleared
2	14JG1A0462	89.33	89.33	88.00	86.67	90.67	Cleared
3	14JG1A0463	86.67	89.33	89.33	89.33	89.33	Cleared
4	14JG1A0464	88.00	89.33	90.67	89.33	89.33	Cleared
5	14JG1A0466	88.00	90.67	90.67	89.33	90.67	Cleared
6	14JG1A0467	93.33	94.67	94.67	93.33	96.00	Cleared
7	14JG1A0468	85.33	88.00	88.00	88.00	89.33	Cleared

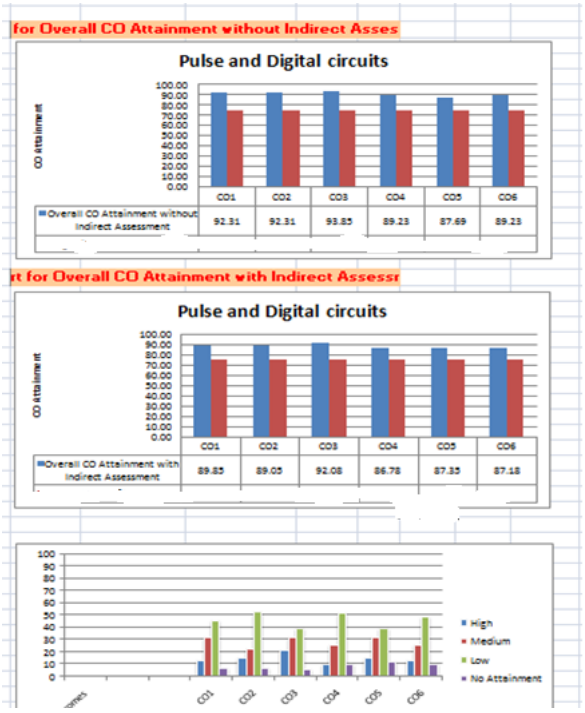
In-Direct Assessment of COs based on student feedbacks

CO-1	CO-2	CO-3	CO-4	CO-5
92	86	90	90	89

Final CO Calculation

Course Outcomes	Overall CO Attainment without Indirect Assessment	Overall CO Attainment with Indirect Assessment	Course Outcomes	High	Medium	Low	No Attainment
CO1	100.00	98.40	CO1	83.08	15.38	1.54	0.00
CO2	100.00	97.20	CO2	86.15	12.31	1.54	0.00
CO3	100.00	98.00	CO3	89.23	10.77	0.00	0.00
CO4	100.00	98.00	CO4	84.62	15.38	0.00	0.00
CO5	100.00	97.80	CO5	90.77	9.23	0.00	0.00

Overall CO attainment of the laboratory course Pulse and Digital Circuits



Graphical representation of CO attainment of the laboratory course Pulse and Digital Circuits

Sample ARCO of Project Internal Review 1

Department of Electronics & Communication Engineering

Project Internal Review-I Evaluation Form

Year and Branch IV ECE | Academic Year: 2018-2019 | Date: 28-01-2019

Sl. No.	Student Name	Regd. No.	Evaluation Criteria							CO Calculation				
			Understanding of the problem and applicability	Presentation	Analysis, Design and Implemetation with valid Results	VIVA	Regularity	Project Progress	Total					
			(5M)	(5M)	(5M)	(5M)	(5M)	(5M)	(30M)	CO1	CO2	CO3	CO4	CO5
1	A SRI NAVYA BHANU	15JG1A0401	4	3	4	3	1	4	24	26.25	27.50	27.50	26.25	20.63
2	ABBIREDDY KUSUMA SRI	15JG1A0402	4	4	2	4	2	4	25	30.00	25.00	25.00	22.50	26.25
3	AISHWARYA KHANGAR	15JG1A0403	4	4	4	4	2	4	28	30.00	30.00	30.00	30.00	26.25
4	AISHWARYA MADDULA	15JG1A0404	4	4	4	4	4	3	29	30.00	30.00	30.00	30.00	28.13

Sample ARCO of Project Internal Review 2

Department of Electronics & Communication Engineering

Project Internal Review-II Evaluation Form

Year and Branch IV ECE | Academic Year: 2018-2019 | Date: 19-03-2019

Sl. No.	Student Name	Regd. No.	Evaluation Criteria							CO Calculation				
			Understanding of the problem and applicability	Presentation	Analysis, Design and Implemetation with valid Results	VIVA	Regularity	Documentation	Total					
			(5M)	(5M)	(5M)	(5M)	(5M)	(5M)	(30M)	CO1	CO2	CO3	CO4	CO5
1	A SRI NAVYA BHANU	15JG1A0401	4	4	4	4	1	4	27	30.00	30.00	30.00	30.00	24.38
2	ABBIREDDY KUSUMA SRI	15JG1A0402	4	4	4	4	4	4	30	30.00	30.00	30.00	30.00	30.00
3	AISHWARYA KHANGAR	15JG1A0403	4	4	4	4	4	4	30	30.00	30.00	30.00	30.00	30.00
4	AISHWARYA MADDULA	15JG1A0404	4	4	4	4	4	3	29	30.00	30.00	30.00	30.00	28.13
5	AKULA SRIJANI VARMA	15JG1A0405	4	3	2	3	4	3	24	26.25	22.50	22.50	18.75	24.38

Sample ARCO of Guide Evaluation

Department of Electronics & Communication Engineering

Project Internal Guide Evaluation Form

Year and Branch: IV ECE | Academic Year: 2018-2019 | Date: 25-03-2019

Sl. No.	Student Name	Regd. No.	Evaluation Criteria				
			Day to Day Work	Involvement	Team Work and Time Managment	Regularity	Total
			(10M)	(10M)	(5M)	(5M)	(30M)
1	A SRI NAVYA BHANU	15JG1A0401	4	4	4	1	27
2	ABBIREDDY KUSUMA SRI	15JG1A0402	4	4	3	4	29
3	AISHWARYA KHANGAR	15JG1A0403	4	4	4	4	30
4	AISHWARYA MADDULA	15JG1A0404	4	4	4	4	30
5	AKULA SRIJANI VARMA	15JG1A0405	4	3	3	4	27

Sample ARCO of Overall Attainment

Gayatri Vidya Parishad College of Engineering for Women

Department of Electronics & Communication Engineering

ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)

Course Name: Main Project Work

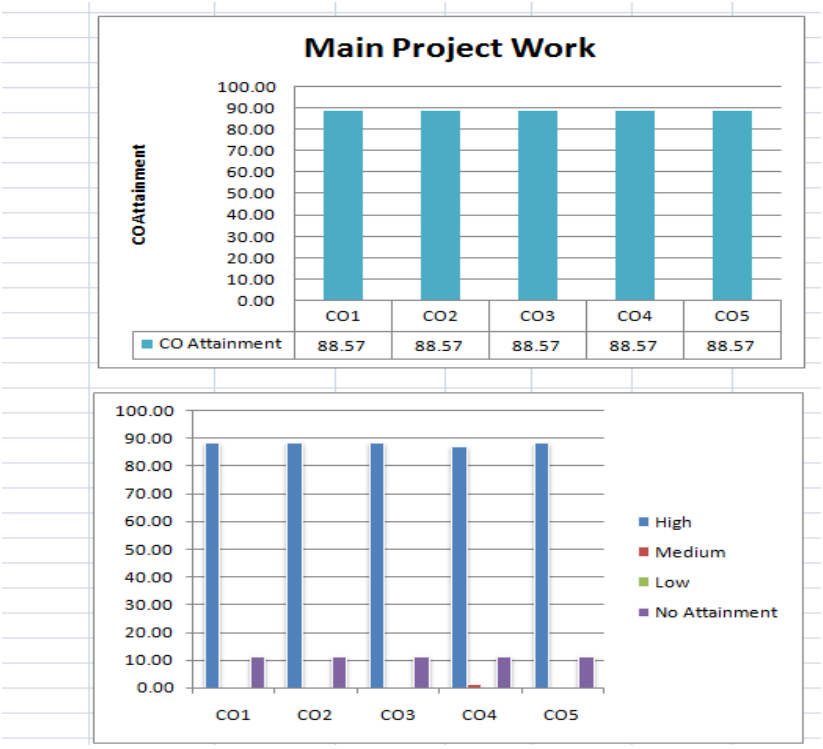
Course Code: RT42045 **Academic Year:** 2018-2019

Year & Semester: IV - II **Section:** ECE1

Sl No	Student Name	Roll No	CO1	CO2	CO3	CO4	CO5	OBE based result
1	A SRI NAVYA BHANU	15JG1A0401	95.38	95.58	95.58	95.38	92.56	Cleared
2	ABBIREDDY KUSUMA SRI	15JG1A0402	97.00	96.17	96.17	95.75	96.38	Cleared
3	AISHWARYA KHANGAR	15JG1A0403	97.50	97.50	97.50	97.50	96.88	Cleared
4	AISHWARYA MADDULA	15JG1A0404	97.50	97.50	97.50	97.50	96.56	Cleared
5	AKULA SRIJANI VARMA	15JG1A0405	91.63	90.17	90.17	88.50	90.69	Cleared
6	ALLA VARSHITA	15JG1A0406	93.13	93.75	93.75	93.13	92.50	Cleared

CO Calculation

Course Outcomes	CO Attainment	Course Outcomes	High	Medium	Low	No Attainment
CO1	88.57	CO1	88.57	0.00	0.00	11.43
CO2	88.57	CO2	88.57	0.00	0.00	11.43
CO3	88.57	CO3	88.57	0.00	0.00	11.43
CO4	88.57	CO4	87.14	1.43	0.00	11.43
CO5	88.57	CO5	88.57	0.00	0.00	11.43



Graphical Representation of CO attainment of a project work

Sample ARCO of Seminar

Department of Electronics & Communication Engineering

CO Evaluation Form

Year and Semester: III - II | Academic Year: 2017-2018 | Date: 27/3/2018

Sl. No.	Student Name	Roll No.	Evaluation Criteria						CO Calculation				
			Understanding of the Topic	Presentation	VIVA	Time Management	Seminar Report	Total					
			(10 M)	(10 M)	(10 M)	(5M)	(15 M)	(50M)	CO1	CO2	CO3	CO4	CO5
1	A SRI NAVYA BHANU	15JG1A0401	3	4	4	4	4	48	87.50	100.00	100.00	92.86	90.00
2	ABBIREDDY KUSUMA SRI	15JG1A0402	4	4	3	3	4	46	87.50	85.00	85.00	100.00	100.00
3	AISHWARYA KHANGAR	15JG1A0403	4	4	3	3	4	47	87.50	85.00	85.00	100.00	100.00
4	AISHWARYA MADDULA	15JG1A0404	3	4	4	4	4	48	87.50	100.00	100.00	92.86	90.00
5	AKULA SRIJANI VARMA	15JG1A0405	3	3	3	3	3	38	75.00	75.00	75.00	75.00	75.00
6	ALLA VARSHITA	15JG1A0406	4	4	3	2	4	45	87.50	80.00	80.00	100.00	100.00
7	ALLAKA JYOTHI HARIKA	15JG1A0407	4	4	3	2	4	45	87.50	80.00	80.00	100.00	100.00
8	ALLURI BHARGAVI	15JG1A0408	4	4	3	3	4	46	87.50	85.00	85.00	100.00	100.00
9	AMITI LAVANYA	15JG1A0409	4	4	4	3	4	49	100.00	95.00	95.00	100.00	100.00
10	ARASAVELLI DHATRIJA	15JG1A0410	3	4	2	3	4	41	62.50	75.00	75.00	92.86	90.00
11	AVASARALA SAISUDHA NIKITHA	15JG1A0411	3	4	4	4	4	48	87.50	100.00	100.00	92.86	90.00
12	B SRI VENKATA NAVEENA	15JG1A0412	3	4	3	3	3	40	75.00	85.00	85.00	82.14	75.00

Overall CO attainment of Seminar

Gayatri Vidya Parishad College of Engineering for Women

Department of Electronics & Communication Engineering

ATTAINMENT REPORT FOR COURSE OUTCOMES (ARCO)

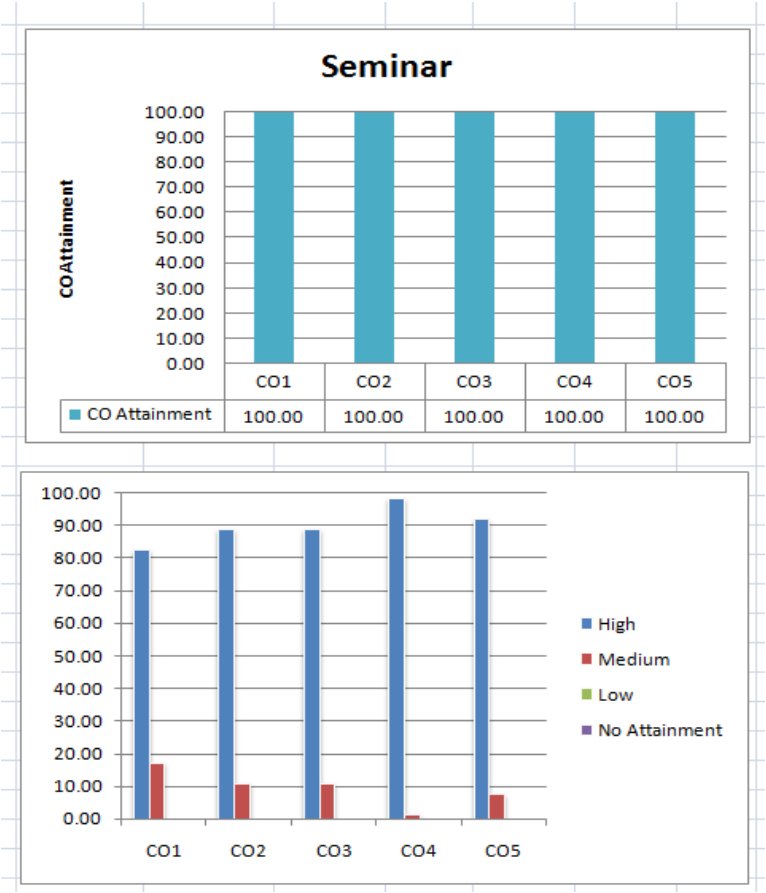
Course Name: Seminar

Course Code: GW6SA | **Academic Year:** 2017-2018

Year & Semester: III - II | **Section:** ECE -1

Sl No	Student Name	Roll No	CO1	CO2	CO3	CO4	CO5	OBE based result
1	A SRI NAVYA BHANU	15JG1A0401	87.50	100.00	100.00	92.86	90.00	Cleared
2	ABBIREDDY KUSUMA SRI	15JG1A0402	87.50	85.00	85.00	100.00	100.00	Cleared
3	AISHWARYA KHANGAR	15JG1A0403	87.50	85.00	85.00	100.00	100.00	Cleared
4	AISHWARYA MADDULA	15JG1A0404	87.50	100.00	100.00	92.86	90.00	Cleared
5	AKULA SRIJANI VARMA	15JG1A0405	75.00	75.00	75.00	75.00	75.00	Cleared
6	ALLA VARSHITA	15JG1A0406	87.50	80.00	80.00	100.00	100.00	Cleared

CO Calculation						
Course Outcomes	CO Attainment	Course Outcomes	High	Medium	Low	No Attainm
CO1	100.00	CO1	82.54	17.46	0.00	0.00
CO2	100.00	CO2	88.89	11.11	0.00	0.00
CO3	100.00	CO3	88.89	11.11	0.00	0.00
CO4	100.00	CO4	98.41	1.59	0.00	0.00
CO5	100.00	CO5	92.06	7.94	0.00	0.00



Graphical representation of CO attainment of a Seminar Course

Record of attainment of COs of all courses with respect to set attainment levels of admitted batches under R13 regulation

Year/Sem	Course Name	Course Code	CO attainment level of 2013 batch (AY:2016-17)	CO attainment level of 2014 batch (AY:2017-18)	CO attainment level of 2015 batch (AY:2018-19)
I-I	English – I	SH101	3	3	3
I-I	Mathematics-I	SH102	1	3	1
I-I	Mathematics-II	SH103	3	3	3
I-I	Engineering Physics	SH104	1.5	2	1.5
I-I	Professional Ethics and Human Values	SH105	3	3	3
I-I	Engineering Drawing	SH106	1.83	3	1.83
I-I	English - Communication Skills Lab-1	SH107	3	3	3
I-I	Engineering Physics Laboratory	SH108	3	3	3
I-I	Engineering Workshop and IT Workshop	SH109	3	3	3
I-II	English – II	SH201	3	3	3

I-II	Mathematics – III	SH202	2.83	3	2.83
I-II	Engineering Chemistry	SH203	3	2.83	3
I-II	Engineering Mechanics	SH204	2.83	3	2.83
I-II	Computer Programming	CS201	2.67	3	2.67
I-II	Network Analysis	EE202	2	3	2
I-II	Engineering Chemistry Laboratory	SH205	3	3	3
I-II	English Communication Skills Lab -2	SH206	3	3	3
I-II	Computer Programming Lab	CS202	3	3	3
II-I	Managerial Economics and Financial Analysis	SH302	3	3	2.5
II-I	Electronic Devices and Circuits	EC301	3	3	2.67
II-I	Data Structures	CS302	3	3	3
II-I	Environmental Studies	SH303	3	3	3
II-I	Signals and Systems	EC302	2	2	2.17
II-I	Electrical Technology	EE305	3	3	3
II-I	Electronic Devices and Circuits Lab	EC303	3	3	3
II-I	Networks &Electrical Technology Lab	EE306	3	3	3
II-II	Electronic Circuit Analysis	EC401	3	3	3
II-II	Management Science	SH402	3	3	3
II-II	Random Variables and Stochastic Processes	EC402	2.5	2	2
II-II	Switching Theory and Logic Design	EC403	2	3	3
II-II	EM Waves and Transmission Lines	EC404	2	2.5	3
II-II	Analog Communications	EC405	3	3	3
II-II	Electronic Circuit Analysis Lab	EC406	3	3	3
II-II	Analog Communications Lab	EC407	3	3	3
III-I	Pulse and Digital Circuits	EC501	3	3	3
III-I	Linear IC Applications	EC502	3	3	3
III-I	Control Systems	EE507	2.33	3	3
III-I	Digital System Design and Digital IC Applications	EC503	3	2.83	2.17

III-I	Antennas and Wave Propagation	EC504	1.5	2	1.83
III-I	Pulse and Digital Circuits Lab	EC505	3	3	3
III-I	LIC Applications Lab	EC506	3	3	3
III-I	Digital System Design and DICA Lab	EC507	3	3	3
III-I	IPR and Patents	SH502	2.5	3	2.5
III-II	Microprocessors and Microcontrollers	EC601	2	3	1.83
III-II	Digital Signal Processing	EC602	2.5	2.33	3
III-II	Digital Communications	EC603	3	2.33	3
III-II	Microwave Engineering	EC604	2	2.83	3
III-II	Open Elective (Bio Medical Engineering)	EC60A	3	3	2.33
III-II	Microprocessors and Microcontrollers Lab	EC605	3	3	3
III-II	Digital Communications Lab	EC606	3	3	3
III-II	Digital Signal Processing Lab	EC607	3	3	3
III-II	Seminar	GW6SA	3	3	3
IV-I	VLSI Design	EC701	3	3	3
IV-I	Computer Networks	EC708	3	3	2
IV-I	Digital Image Processing	EC702	2	3	1.5
IV-I	Computer Architecture and Organization	CS709	3	3	2
IV-I	Radar Systems (Elective I)	EC7EC	3	3	2.17
IV-I	Optical Communication (Elective II)	EC7ED	3	3	2.5
IV-I	V L S I Lab	EC703	3	3	3
IV-I	Microwave Engineering Lab	EC704	3	3	3
IV-II	Cellular Mobile Communication	EC801	3	3	3
IV-II	Electronic Measurements and Instrumentation	EC802	3	2.5	3
IV-II	Satellite Communication (Elective III)	EC8EA	3	3	3
IV-II	Low Power IC Design (Elective IV)	EC8EG	2.5	3	2.5
IV-II	Project and Seminar	GW8PA	3	3	3

Attainment of Program Outcomes (POs)/ Program Specific Outcomes (PSOs)

POs and PSOs attainment with Direct Assessment

The attainment of POs and PSOs is evaluated with direct assessment and is recorded for every subject is demonstrated.

2013 admitted batch

Course	Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 1	PSO2
SH101	-	-	-	-	-	1.00	-	-	1.50	1.33	-	-	-	-
SH102	1.00	0.67	-	-	0.67	-	-	-	-	-	0.67	0.67	-	0.33
SH103	3.00	2.00	-	-	2.00	-	-	-	-	-	2.00	2.00	-	1.00
SH104	1.50	0.84	0.50	0.67	-	-	-	-	-	-	-	-	-	-
SH105	-	-	1.00	-	-	1.17	1.50	3.00	2.00	-	1.00	1.00	-	-
SH106	1.22	0.61	0.92	-	-	-	-	-	-	-	-	-	-	-
SH107	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SH108	1.80	1.00	1.00	1.00	-	-	-	-	-	-	-	-	-	-
SH109	1.00	1.00	1.00	1.00	2.00	-	-	-	-	-	-	-	-	-
SH201	-	-	-	-	-	2.50	-	-	1.50	1.67	-	-	-	-
SH202	2.83	1.89	-	-	1.89	-	-	-	-		1.89	1.89		0.94
SH203	1.50	1.00	1.00	-	-	1.33	1.33	1.00	-	-	-	-	-	-
SH204	2.83	1.89	0.94	-	-	-	-	-	-	-	-	-	-	-
CS201	1.25	1.49	0.89	-	-	-	-	-	-	-		1.34		1.34
EE202	2.00	1.11	0.89	-	-	-	-	-	-	-		1.33	0.67	1.11
SH205	1.00	1.00	1.00	1.33	1.00	1.00	1.00	-	-	-	-	-	-	-
SH206	-	-	-	-	-	-	-	-	1.00	2.20	-	-	-	-
CS202	1.00	-	-	1.00	1.80	-	-	-	-	-	-	-	-	1.40
SH302	-	-	-	-	-	-	-	1.00	1.33	1.25	1.83	3.00	-	-
EC301	1.83	2.00	1.00	1.40	-	-	-	-	-	-	-	1.50	1.67	1.00
CS302	1.50	1.67	1.00	1.00	1.00	-	-	-	-	-	-	-	2.00	2.00
SH303	-	-	1.00	-	-	1.67	2.50	1.83	-	-	-	-	-	-
EC302	1.33	1.89	1.22		1.11	-	-	-	-	-	-	1.55	1.89	1.33
EE305	2.00	1.17	-	-	-	-	-	-	-	-	-	-	1.00	2.00
EC303	1.00	1.00	-	3.00	-	-	-	-	-	-	-	1.00	1.00	2.40
EE306	3.00	2.20	-	2.00	-	-	-	-	-	-	-	-	1.00	-
EC401	2.00	1.67	1.00	1.40	-	1.00	-	-	-	-	-	1.00	1.67	1.67
SH402	2.00	2.00	-	-	-	1.00	1.67	-	2.50	1.80	2.60	3.00	-	-
EC402	1.53	1.81	0.83	-	-	0.83	-	-	-	-	-	1.67	1.81	1.25
EC403	1.00	1.11	1.33	-	-	-	-	-	-	-	-	1.11	1.00	1.33

EC404	0.89	1.22	1.07	-	-	-	-	-	-	-	-	1.67	1.33	1.00
EC405	1.50	2.00	1.50	-	-	-	-	-	-	-	-	1.17	1.83	1.50
EC406	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	-	1.00	3.00
EC407	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	1.00	1.00	2.40
EC501	1.83	2.33	2.33	-	-	-	-	-	-	-	-	1.33	2.17	1.50
EC502	2.00	2.17	2.00	-	-	-	-	-	-	-	-	1.50	1.67	1.83
EE507	2.33	1.94	1.55	-	-	-	-	-	-	-	-	-	2.33	1.55
EC503	1.17	1.67		2.00	3.00	-	-	-	-	-	-	1.50	1.67	2.67
EC504	0.90	1.17	0.80	-	-	-	1.00	-	-	-	-	1.00	1.00	1.17
EC505	2.00	1.80	2.00	-	1.00	1.60	-	-	-	-	-	1.80	2.40	2.60
EC506	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	2.00	1.60	3.00
EC507	-	-	-	2.40	3.00	-	-	-	-	-	-	2.00	1.60	2.00
SH502	-	-	0.83	-	-	1.53	0.98	0.83	1.53	-	1.39	1.25	-	-
EC601	0.83	1.00	1.67	0.67	1.33	1.33	-	-	-	-	-	1.33	1.11	1.00
EC602	1.94	2.17	1.67	-	-	1.67	-	-	-	-	-	1.53	2.08	2.00
EC603	2.00	2.33	2.33	2.00	-	2.00	-	-	-	-	-	1.67	2.00	2.67
EC604	0.89	1.11	1.00	1.00	1.33	1.11	-	-	-	-	-	0.89	0.67	1.33
EC6OA	3.00	2.00	3.00	-	-	2.00	-	-	-	-	-	-	2.50	3.00
EC605	1.00	1.40	1.60	2.00	2.40	-	-	-	1.80	-	1.00	2.00	2.00	1.40
EC606	1.60	2.00	2.40	3.00	-	-	-	-	2.00	2.00	1.00	-	2.00	2.60
EC607	2.40	2.20	1.40	2.60	3.00	-	-	-	-	-	-	2.00	2.80	2.60
GW6SA	3.00	2.00	-	-	-	-	-	2.50	1.00	3.00	1.50	1.50	2.00	-
EC701	2.00	1.83	2.00	-	-	-	-	-	-	-	-	1.17	2.17	2.00
CS708	2.00	2.33	2.33	1.67	-	-	-	-	-	-	-	2.50	-	1.67
EC702	2.00	1.78	1.33	-	-	1.47	-	-	-	-	-	1.45	1.78	1.55
CS709	1.67	1.50	-	-	-	-	-	-	-	-	-	1.00	1.25	-
EC7EC	2.00	2.00	1.17	-	-	-	-	-	-	-	-	1.33	3.00	2.17
EC7ED	2.33	2.17	1.60	2.40	-	-	-	-	-	-	-	1.80	3.00	2.17
EC703	1.50	2.00	-	2.00	3.00	-	-	-	-	-	-	2.00	1.40	2.20
EC704	1.00	1.60	-	2.20	-	-	-	-	-	-	-	2.20	2.40	1.60
EC801	1.67	2.00	1.83	-	1.00	-	-	-	-	-	-	1.67	1.83	1.67
EC802	2.17	2.00	1.50	-	-	-	-	-	-	-	-	2.17	2.17	1.83
EC8EA	1.33	2.00	1.50	-	-	-	-	-	-	-	-	2.00	3.00	2.17
EC8EG	1.04	2.08	1.67	-	1.67	-	-	-	-	-	-	1.39	1.94	1.67
GW8PA	2.50	2.50	2.50	1.00	3.00	-	-	2.00	3.00	3.00	2.00	2.00	2.00	2.00

2014 admitted batch

Course	**Program Outcomes (POs) and Program Specific Outcomes (PSOs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO 11**	**PO 12**	**PSO 1**	**PSO2**

SH101	-	-	-	-	-	1.00	-	-	1.50	1.33	-	-	-	-
SH102	3.00	2.00	-	-	2.00	-	-	-	-	-	2.00	2.00	-	0.33
SH103	3.00	2.00	-	-	2.00	-	-	-	-	-	2.00	2.00	-	1.00
SH104	2.00	1.11	0.67	0.89	-	-	-	-	-	-	-	-	-	-
SH105	-	-	1.00	-	-	1.17	1.50	3.00	2.00	-	1.00	1.00	-	-
SH106	2.00	1.00	1.50	-	-	-	-	-	-	-	-	-	-	-
SH107	-	-		-	-	-	-	-	-	2.20	-	-	-	-
SH108	1.80	1.00	1.00	1.00		-	-	-	-	-	-	-	-	-
SH109	1.00	1.00	1.00	1.00	2.00	-	-	-	-	-	-	-	-	-
SH201	-	-	-	-		2.50	-	-	1.50	1.67	-	-	-	-
SH202	3.00	2.00	-	-	2.00	-	-	-	-	-	2.00	2.00	-	0.94
SH203	1.42	0.94	0.94	-	-	1.25	1.25	0.94	-	-	-	-	-	-
SH204	3.00	2.00	1.00	-	-	-	-	-	-	-	-	-	-	-
CS201	1.40	1.67	1.00	-	-	-	-	-	-	-	-	1.50	-	1.34
EE202	3.00	1.67	1.33	-	-	-	-	-	-	-	-	2.00	1.00	1.11
SH205	1.00	1.00	1.00	1.33	1.00	1.00	1.00	-	-	-	-	-	-	-
SH206	-	-	-	-	-	-	-	-	1.00	2.20	-	-	-	-
CS202	1.00	-	-	1.00	1.80	-	-	-	-	-	-	-	-	1.40
SH302		-	-			-	-	0.33	0.44	0.42	0.61	1.00	-	-
EC301	1.83	2.00	1.00	1.40		-	-	-	-	-	-	1.50	1.67	0.89
CS302	1.50	1.67	1.00	1.00	1.00	-	-	- -	-	-	-	-	2.00	2.00
SH303	-	-	1.00	-	-	1.67	2.50	1.83	-	-	-	-	-	-
EC302	1.33	1.89	1.22	-	1.11	-	-	-	-	-	-	1.55	1.89	1.45
EE305	2.00	1.17	-	-	-	-	-	-	-	-	-	-	1.00	2.00
EC303	1.00	1.00	-	3.00	-	-	-	-	-	-	-	1.00	1.00	2.40
EE306	3.00	2.20	-	2.00	-	-	-	-	-	-	-	-	1.00	-
EC401	2.00	1.67	1.00	1.40	-	1.00	-	-	-	-	-	1.00	1.67	1.67
SH402	1.33	1.33	-	-	-	0.67	1.11	-	1.67	1.20	1.73	2.00	-	-
EC402	1.22	1.45	0.67	-	-	0.67		-	-	-	-	1.33	1.45	1.00
EC403	1.00	1.11	1.33	-	-	-	-	-	-	-	-	1.11	1.00	2.00
EC404	1.11	1.53	1.33	-	-	-	-	-	-	-	-	2.08	1.67	1.50
EC405	1.50	2.00	1.50	-	-	-	-	-	-	-	-	1.17	1.83	1.50
EC406	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	-	1.00	3.00
EC407	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	1.00	1.00	2.40
EC501	1.83	2.33	2.33	-	-	-	-	-	-	-	-	1.33	2.17	1.50
EC502	2.00	2.17	2.00	-	-	-	-	-	-	-	-	1.50	1.67	1.83
EE507	3.00	2.50	2.00	-	-	-	-	-	-	-	-	-	3.00	2.00
EC503	1.10	1.58	-	1.89	2.83	-	-	-	-	-	-	1.42	1.58	1.93
EC504	1.20	1.55	1.07	-	-	-	1.33	-	-	-	-	1.33	1.33	1.42
EC505	2.00	1.80	2.00	-	1.00	1.60	-	-	-	-	-	1.80	2.40	2.60
EC506	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	2.00	1.60	3.00
EC507	-	-	-	2.40	3.00	-	-	-	-	-	-	2.00	1.60	2.00
SH502	-	-	1.00	-	-	1.83	1.17	1.00	1.83	-	1.67	1.50	-	-
EC601	1.25	1.50	2.50	1.00	2.00	2.00	-	-	-	-	-	2.00	1.67	0.92
EC602	1.81	2.02	1.55	-	-	1.55	-	-	-	-	-	1.42	1.94	2.40
EC603	1.55	1.81	1.81	1.55	-	1.55	-	-	-	-	-	1.30	1.55	2.67
EC604	1.25	1.58	1.42	1.42	1.89	1.58	-	-	-	-	-	1.25	0.94	2.00
EC6OA	3.00	2.00	3.00	-	-	2.00	-	-	-	-	-	-	2.50	2.33
EC605	1.00	1.40	1.60	2.00	2.40	-	-	-	1.80		1.00	2.00	2.00	1.40
EC606	1.60	2.00	2.40	3.00	-	-	-	-	2.00	2.00	1.00	-	2.00	2.60

EC607	2.40	2.20	1.40	2.60	3.00	-	-	-	-	-	-	2.00	2.80	2.60
GW6SA	3.00	2.00	-	-	-	-	-	2.50	1.00	3.00	1.50	1.50	2.00	-
EC701	2.00	1.83	2.00	-	-	-	-	-	-	-	-	1.17	2.17	2.00
CS708	2.00	2.33	2.33	1.67	-	-	-	-	-	-	-	2.50	-	1.11
EC702	3.00	2.67	2.00	-	-	2.20	-	-	-	-	-	2.17	2.67	1.17
CS709	1.67	1.50	-	-	-	-	-	-	-	-	-	1.00	1.25	-
EC7EC	2.00	2.00	1.17		-	-	-	-	-	-	-	1.33	3.00	1.57
EC7ED	2.33	2.17	1.60	2.40	-	-	-	-	-	-	-	1.80	3.00	1.81
EC703	1.50	2.00	-	2.00	3.00	-	-	-	-	-	-	2.00	1.40	2.20
EC704	1.00	1.60	-	2.20	-	-	-	-	-	-	-	2.20	2.40	1.60
EC801	1.67	2.00	1.83	-	1.00	-	-	-	-	-	-	1.67	1.83	1.67
EC802	0.72	0.67	0.50	-	-	-	-	-	-	-	-	0.72	0.72	1.83
EC8EA	0.89	1.33	1.00	-	-	-	-	-	-	-	-	1.33	2.00	2.17
EC8EG	1.25	2.50	2.00	-	2.00	-	-	-	-	-	-	1.67	2.33	1.67
GW8PA	2.50	2.50	2.50	1.00	3.00	-	-	2.00	3.00	3.00	2.00	2.00	2.00	2.00

2015 admitted batch

Course	**Program Outcomes (POs) and Program Specific Outcomes (PSOs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO 11**	**PO 12**	**PSO 1**	**PSO2**
SH101	-	-	-	-	-	1.00	-	-	1.50	1.33	-	-	-	-
SH102	1.00	0.67	-	-	0.67	-	-	-	-	-	0.67	0.67	-	0.33
SH103	3.00	2.00	-	-	2.00	-	-	-	-	-	2.00	2.00	-	1.00
SH104	1.50	0.84	0.50	0.67	-	-	-	-	-	-	-	-	-	-
SH105	-	-	1.00	-	-	1.17	1.50	3.00	2.00	-	1.00	1.00	-	-
SH106	1.22	0.61	0.92	-	-	-	-	-	-	-	-	-	-	-
SH107	-	-	-	-	-	-	-	-	-	2.20	-	-	-	-
SH108	1.80	1.00	1.00	1.00	-	-	-	-	-	-	-	-	-	-
SH109	1.00	1.00	1.00	1.00	2.00	-	-	-	-	-	-	-	-	-
SH201	-	-	-	-	-	2.50	-	-	1.50	1.67	-	-	-	-
SH202	2.83	1.89	-	-	1.89	-	-	-	-	-	1.89	1.89	-	0.94
SH203	1.50	1.00	1.00	-	-	1.33	1.33	1.00	-	-	-	-	-	-
SH204	2.83	1.89	0.94	-	-	-	-	-	-	-	-	-	-	-
CS201	1.25	1.49	0.89	-	-	-	-	-	-	-	-	1.34	-	1.34
EE202	2.00	1.11	0.89	-	-	-	-	-	-	-	-	1.33	0.67	1.11
SH205	1.00	1.00	1.00	1.33	1.00	1.00	1.00	-	-	-	-	-	-	-
SH206	-	-	-	-	-	-	-	-	1.00	2.20	-	-	-	-
CS202	1.00	-	-	1.00	1.80	-	-	-	-	-	-	-	-	1.40
SH302	-	-	-	-	-	-	-	0.83	1.11	1.04	1.53	2.50	-	-
EC301	1.63	1.78	0.89	1.25	-	-	-	-	-	-	-	1.34	1.49	0.89
CS302	1.50	1.67	1.00	1.00	1.00	-	-	-	-	-	-	-	2.00	2.00
SH303	-	-	1.00	-	-	1.67	2.50	1.83	-	-	-	-	-	-

EC302	1.45	2.05	1.32	-	1.21	-	-	-	-	-	-	1.69	2.05	1.45
EE305	2.00	1.17	-	-	-	-	-	-	-	-	-	-	1.00	2.00
EC303	1.00	1.00	-	3.00	-	-	-	-	-	-	-	1.00	1.00	2.40
EE306	3.00	2.20	-	2.00	-	-	-	-	-	-	-	-	1.00	-
EC401	2.00	1.67	1.00	1.40	-	1.00	-	-	-	-	-	1.00	1.67	1.67
SH402	2.00	2.00	-	-	-	1.00	1.67	-	2.50	1.80	2.60	3.00	-	-
EC402	1.22	1.45	0.67	-	-	0.67	-	-	-	-	-	1.33	1.45	1.00
EC403	1.50	1.67	2.00	-	-	-	-	-	-	-	-	1.67	1.50	2.00
EC404	1.33	1.83	1.60	-	-	-	-	-	-	-	-	2.50	2.00	1.50
EC405	1.50	2.00	1.50	-	-	-	-	-	-	-	-	1.17	1.83	1.50
EC406	1.00	1.00		3.00	2.00	-	-	-	-	-	-	-	1.00	3.00
EC407	1.00	1.00		3.00	2.00	-	-	-	-	-	-	1.00	1.00	2.40
EC501	1.83	2.33	2.33	-	-	-	-	-	-	-	-	1.33	2.17	1.50
EC502	2.00	2.17	2.00	-	-	-	-	-	-	-	-	1.50	1.67	1.83
EE507	3.00	2.50	2.00	-	-	-	-	-	-	-	-	-	3.00	2.00
EC503	0.85	1.21		1.45	2.17	-	-	-	-	-	-	1.09	1.21	1.93
EC504	1.10	1.42	0.98	-	-	-	1.22	-	-	-	-	1.22	1.22	1.42
EC505	2.00	1.80	2.00	-	1.00	1.60		-	-	-	-	1.80	2.40	2.60
EC506	1.00	1.00	-	3.00	2.00	-	-	-	-	-	-	2.00	1.60	3.00
EC507	-	-	-	2.40	3.00	-	-	-	-	-	-	2.00	1.60	2.00
SH502	-	-	0.83	-	-	1.53	0.98	-	-	-	1.39	1.25	-	-
EC601	0.76	0.92	1.53	0.61	1.22	1.22	-	-	-	-	-	1.22	1.02	0.92
EC602	2.33	2.60	2.00	-	-	2.00	-	-	-	-	-	1.83	2.50	2.40
EC603	2.00	2.33	2.33	2.00	-	2.00	-	-	-	-	-	1.67	2.00	2.67
EC604	1.33	1.67	1.50	1.50	2.00	1.67	-	-	-	-	-	1.33	1.00	2.00
EC6OA	2.33	1.55	2.33	-	-	1.55	-	-	-	-	-	-	1.94	2.33
EC605	1.00	1.40	1.60	2.00	2.40	-	-	-	-	-	1.00	2.00	2.00	1.40
EC606	1.60	2.00	2.40	3.00	-	-	-	-	-	2.00	1.00	-	2.00	2.60
EC607	2.40	2.20	1.40	2.60	3.00	-	-	-	-	-	-	2.00	2.80	2.60
GW6SA	3.00	2.00	-	-	-	-	-	-	-	3.00	1.50	1.50	2.00	-
EC701	2.00	1.83	2.00	-	-	-	-	-	-	-	-	1.17	2.17	2.00
CS708	1.33	1.55	1.55	1.11	-	-	-	-	-	-	-	1.67	-	1.11
EC702	1.50	1.34	1.00	-	-	1.10		-	-	-	-	1.09	1.34	1.17
CS709	1.11	1.00	-	-	-	-	-	-	-	-	-	0.67	0.83	-
EC7EC	1.45	1.45	0.85	-	-	-	-	-	-	-	-	0.96	2.17	1.57
EC7ED	1.94	1.81	1.33	2.00	-	-	-	-	-	-	-	1.50	2.50	1.81
EC703	1.50	2.00	-	2.00	3.00	-	-	-	-	-	-	2.00	1.40	2.20
EC704	1.00	1.60	-	2.20	-	-	-	-	-	-	-	2.20	2.40	1.60
EC801	1.67	2.00	1.83	-	1.00	-	-	-	-	-	-	1.67	1.83	1.67

EC802	2.17	2.00	1.50	-	-	-	-	-	-	-	-	2.17	2.17	1.83
EC8EA	1.33	2.00	1.50	-	-	-	-	-	-	-	-	2.00	3.00	2.17
EC8EG	1.04	2.08	1.67	-	1.67	-	-	-	-	-	-	1.39	1.94	1.67
GW8PA	2.50	2.50	2.50	1.00	3.00	-	-	2.00	3.00	3.00	2.00	2.00	2.00	2.00

POs and PSOs attainment with direct assessment for three admitted batches

$$\sum_{i=1}^{12} PO_i + \sum_{j=1}^{2} PSO_j$$

where POs/PSOs are the attainment of each course listed above.

Admitted Batch	**Program Outcomes (POs) and Program Specific Outcomes (PSOs)**													
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
2015	**1.66**	**1.62**	**1.42**	**1.79**	**1.86**	**1.41**	**1.46**	**1.71**	**1.72**	**2.03**	**1.51**	**1.57**	**1.76**	**1.78**
2014	**1.77**	**1.69**	**1.48**	**1.85**	**2.00**	**1.48**	**1.41**	**1.66**	**1.61**	**1.89**	**1.50**	**1.58**	**1.78**	**1.78**
2013	**1.69**	**1.64**	**1.42**	**1.84**	**1.87**	**1.42**	**1.43**	**1.74**	**1.74**	**2.05**	**1.53**	**1.60**	**1.78**	**1.80**

POs and PSOs attainment with Indirect Assessment

2013 batch

Admitted Batch	**Indirect Attainment**	**Program Outcomes (POs)/ Program Specific Outcomes (PSOs)**													
		PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 01**	**PSO 02**
2013	***Indirect POs/PSOs /student exit***	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
	Indirect POs/PSOs /Employer	**2**	**2**	**1**	**1**	**2**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**3**	**3**
	Indirect POs/PSOs /Alumni	**3**	**3**	**2**	**3**	**3**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
	Indirect POs/PSOs / parent								**3**		**3**				
	Indirect POs/PSOs attainment	**3**	**3**	**1.75**	**2.5**	**2.75**	**2**	**2.25**	**1.7**	**1.75**	**2.55**	**3**	**2.75**	**3**	**3**

2014 batch

Admitted Batch	**Indirect Attainment**	**Program Outcomes (POs)/ Program Specific Outcomes (PSOs)**													
		PO	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PSO**	**PSO**

		1	2	3	4	5	6	7	8	9	10	11	12	01	02
2014	*Indirect POs/PSOs /student exit*	3	3	3	2	3	3	1	1	2	3	3	3	3	3
	Indirect POs/PSOs /Employer	2	2	2	2	2	2	2	2	2	2	2	2	3	3
	Indirect POs/PSOs /Alumni	3	3	3	3	3	2	2	2	2	1	3	3	3	3
	Indirect POs/PSOs / parent								3		3				
	Indirect POs/PSOs attainment	2.75	2.75	2.75	2.25	2.75	2.5	1.5	1.7	2	2.55	2.75	2.75	3	3

2015 batch

Admitted Batch	Indirect Attainment	Program Outcomes (POs)/ Program Specific Outcomes (PSOs)													
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 01	PSO 02
2015	*Indirect POs/PSOs /student exit*	3	3	3	2	3	3	1	1	2	3	3	3	3	3
	Indirect POs/PSOs /Employer	2	2	2	2	2	2	2	2	1	1	2	2	3	3
	Indirect POs/PSOs /Alumni	3	3	3	3	3	2	2	2	2	2	3	3	3	3
	Indirect POs/PSOs / parent								3		3				
	Indirect POs/PSOs attainment	2.75	2.75	2.75	2.25	2.75	2.5	1.5	1.7	1.75	2.55	2.75	2.75	3	3

Overall POs/PSOs attainment considering both Direct and Indirect Assessments

2013 batch

Admitted	*POs/PSOs Attainment*	Program Outcomes (POs) and Program Specific Outcomes (PSOs)

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO01	PSO02
2013	80 % Direct POs/PSOs attainment (A)	1.35	1.31	1.14	1.47	1.50	1.14	1.14	1.39	1.39	1.64	1.23	1.28	1.42	1.44
	20 % Indirect POs/PSOs attainment (B)	0.6	0.6	0.35	0.50	0.55	0.40	0.45	0.34	0.35	0.51	0.6	0.55	0.60	0.60
	Overall POs/PSOs attainment (A+B)	1.95	1.91	1.49	1.97	2.05	1.54	1.59	1.73	1.74	2.15	1.83	1.83	2.02	2.04

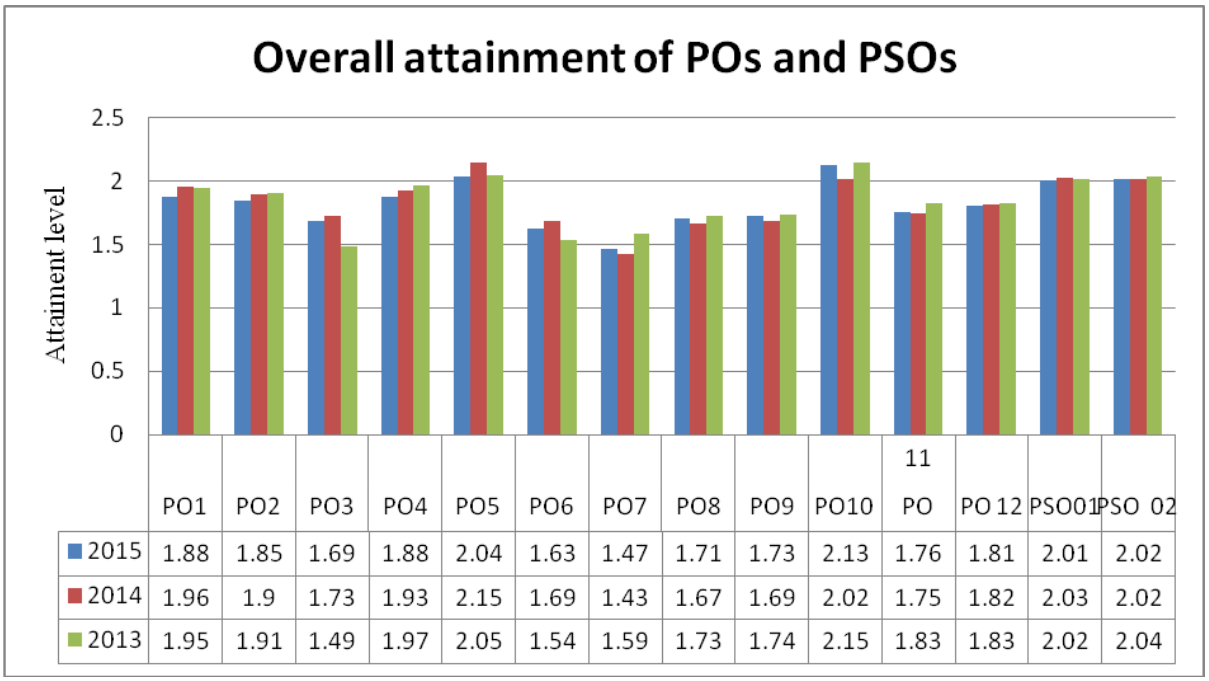
2014 batch

Admitted Batch	POs/PSOs Attainment	Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 01	PSO 02
2014	80 % Direct POs/PSOs attainment (A)	1.41	1.35	1.18	1.48	1.60	1.19	1.13	1.33	1.29	1.51	1.20	1.27	1.43	1.42
	20 % Indirect POs/PSOs attainment (B)	0.55	0.55	0.55	0.45	0.55	0.50	0.30	0.34	0.40	0.51	0.55	0.55	0.60	0.60
	Overall POs/PSOs attainment (A+B)	1.96	1.90	1.73	1.93	2.15	1.69	1.43	1.67	1.69	2.02	1.75	1.82	2.03	2.02

2015 batch

Admitted Batch	POs/PSOs Attainment	Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 01	PSO 02
2015	80 % Direct POs/PSOs attainment (A)	1.33	1.30	1.14	1.43	1.49	1.13	1.17	1.37	1.38	1.62	1.21	1.26	1.41	1.42
	20 % Indirect POs/PSOs attainment (B)	0.55	0.55	0.55	0.45	0.55	0.50	0.30	0.34	0.35	0.51	0.55	0.55	0.60	0.60
	Overall POs/PSOs attainment (A+B)	1.88	1.85	1.69	1.88	2.04	1.63	1.47	1.71	1.73	2.13	1.76	1.81	2.01	2.02

Graphical representation of POs/PSOs Attainment of admitted batches under R13 regulation



Process to set target level of POs/PSOs

A: The average of each POs/PSOs of all courses are calculated and recorded

I: The possible highest level of values are considered i.e. 3

Target level = *Sum (80% of A+20% of I)*

The below table suggests the set target level of three admitted batches and the values of set target level for each POs/PSOs.

		Program Outcomes (POs) and Program Specific Outcomes (PSOs)													
		PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO 11***	***PO 12***	***PSO 01***	***PSO 02***
CO-POs/PSOs mapping averages (A)		1.90	1.83	1.60	1.89	2.04	1.59	1.60	1.76	1.77	2.05	1.69	1.78	1.94	1.97
Indirect value (I)		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Sum (80% of A+20% of I)		2.12	2.07	1.88	2.11	2.23	1.87	1.88	2.01	2.02	2.24	1.95	2.03	2.15	2.17
2013 batch	***75% of Sum***	1.59	1.55	1.41	1.59	1.67	1.40	1.41	1.51	1.51	1.68	1.46	1.52	1.61	1.63
2014 batch	***80% of Sum***	1.70	1.65	1.50	1.69	1.79	1.50	1.50	1.61	1.61	1.79	1.56	1.62	1.72	1.74
2015 batch	***85% of Sum***	1.80	1.76	1.60	1.80	1.90	1.59	1.60	1.71	1.71	1.90	1.66	1.72	1.83	1.85

The analysis of POs/PSOs are carried out for the three admitted batches based on the decided target level given in Table below along with POs/PSOs attainment values.

Overall POs and PSOs attainment for three admitted batches

Admitted Batch	*POs/PSOs Attainment*	**Program Outcomes (POs) and Program Specific Outcomes (PSOs)**												
		PO1	*PO2*	*PO3*	*PO4*	*PO5*	*PO6*	*PO7*	*PO8*	*PO9*	*PO10*	*PO 11*	*PO 12*	*PSO 01*	*PSO 02*
2015	*Overall POs/PSOs attainment*	**1.88**	**1.85**	**1.69**	**1.88**	**2.04**	**1.63**	**1.47**	**1.71**	**1.73**	**2.13**	**1.76**	**1.81**	**2.01**	**2.02**
	Target level	**1.80**	**1.76**	**1.60**	**1.80**	**1.90**	**1.59**	**1.60**	**1.71**	**1.71**	**1.90**	**1.66**	**1.72**	**1.83**	**1.85**
2014	*Overall POs/PSOs attainment*	**1.96**	**1.90**	**1.73**	**1.93**	**2.15**	**1.69**	**1.43**	**1.67**	**1.69**	**2.02**	**1.75**	**1.82**	**2.03**	**2.02**
	Target level	**1.70**	**1.65**	**1.50**	**1.69**	**1.79**	**1.50**	**1.50**	**1.61**	**1.61**	**1.79**	**1.56**	**1.62**	**1.72**	**1.74**
2013	*Overall POs/PSOs attainment*	**1.95**	**1.91**	**1.49**	**1.97**	**2.05**	**1.54**	**1.59**	**1.73**	**1.74**	**2.15**	**1.83**	**1.83**	**2.02**	**2.04**
	Target level	**1.59**	**1.55**	**1.41**	**1.59**	**1.67**	**1.40**	**1.41**	**1.51**	**1.51**	**1.68**	**1.46**	**1.52**	**1.61**	**1.63**

Action Taken Report

Actions taken based on the results of evaluation of each of the POs & PSOs